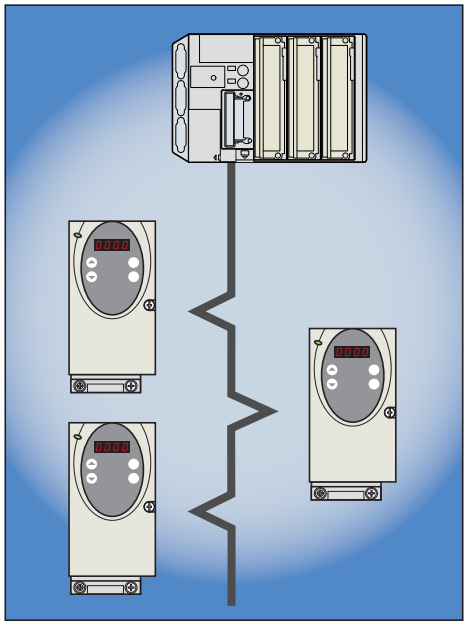
Altivar 31

User's manual

Communication variables

V1.7



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NOTE

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General

This manual relates to software version V1.7 for Altivar 31 drives.
The Altivar 31 can be connected directly to Modbus and CANopen buses by means of an RJ45 connector, which supports both protocols.
The communication function provides access to the drive's configuration, adjustment, control and monitoring functions.

The "Communication variables" User's Manual defines the drive control processes and the drive variables which can be accessed by these buses.

It supplements each of the following manuals:

- Modbus
- CANopen

These documents should be referred to for the hardware and software setup specific to each bus.

We also recommend consulting the Programming Manual for additional explanations (operation, factory settings, etc).
If the PowerSuite software workshop is used, consult the on-line help provided.

The communication variables are listed with:
- Their address •••• in decimal format for Modbus
- Their index and subindex address ••••/•• in hexadecimal format for CANopen

They are grouped into several different tables according to the following criteria:
- DRIVECOM variables
- control variables
- monitoring variables
- identification variables
- configuration and adjustment variables

Read/write

Whether the parameters have read and/or write access is indicated in the "Read/Write" column with the following codes:
- R: read only, drive stopped or running
- R/WS: read access when drive stopped or running and write access only when drive stopped
- R/W: read and write access when drive stopped or running

Authorized addresses

Only the addresses and values defined in this document can be used. Any other address or value must be considered to be reserved and must never be written. Failure to observe this precaution may result in malfunctions.

Control modes

Control and reference channels

The control and the reference may originate from different channels:
- the terminal block
- the built-in keypad (ATV31...A only)
- the remote display terminal
- Modbus
- CANopen

These channels are managed:
- either in priority mode for compatibility with the ATV28
- or in deterministic mode

The "Function access level (LAC)" and "Mixed mode (CHCF)" parameters are used to select the run mode.
Operation is described in detail in the Programming Manual ("Control menu" section).

Priority stops

In line mode, stop requests which can be activated by the terminals or by the remote display terminal always have priority:

Type of stop	From	Drivecom state reached	Actions for restoring control of the Altivar using the fieldbus
Fast stop	LI2 to LI6	"Operation enabled"	- Set the logic input assigned to the "fast stop" function to 1 (active at 0)
DC injection stop	LI2 to LI6	"Operation enabled"	- Set the logic input assigned to the "injection stop" function to 0 (active at 1)
Freewheel stop	LI2 to LI6	"Switch on disabled"	- Set the logic input assigned to the "freewheel stop" function to 1 (active at 0) - Perform the transitions required to return the drive to "run" status
3-wire control stop via STOP logic input (LI1)	LI1 (3-wire control)	"Switch on disabled"	- Set the logic input assigned to STOP to 1 (active at 0) - Perform the transitions required to return the drive to "run" status
Stop by the display terminal	STOP key (1)	"Switch on disabled"	- Release the Stop key - Perform the transitions required to return the drive to "run" status

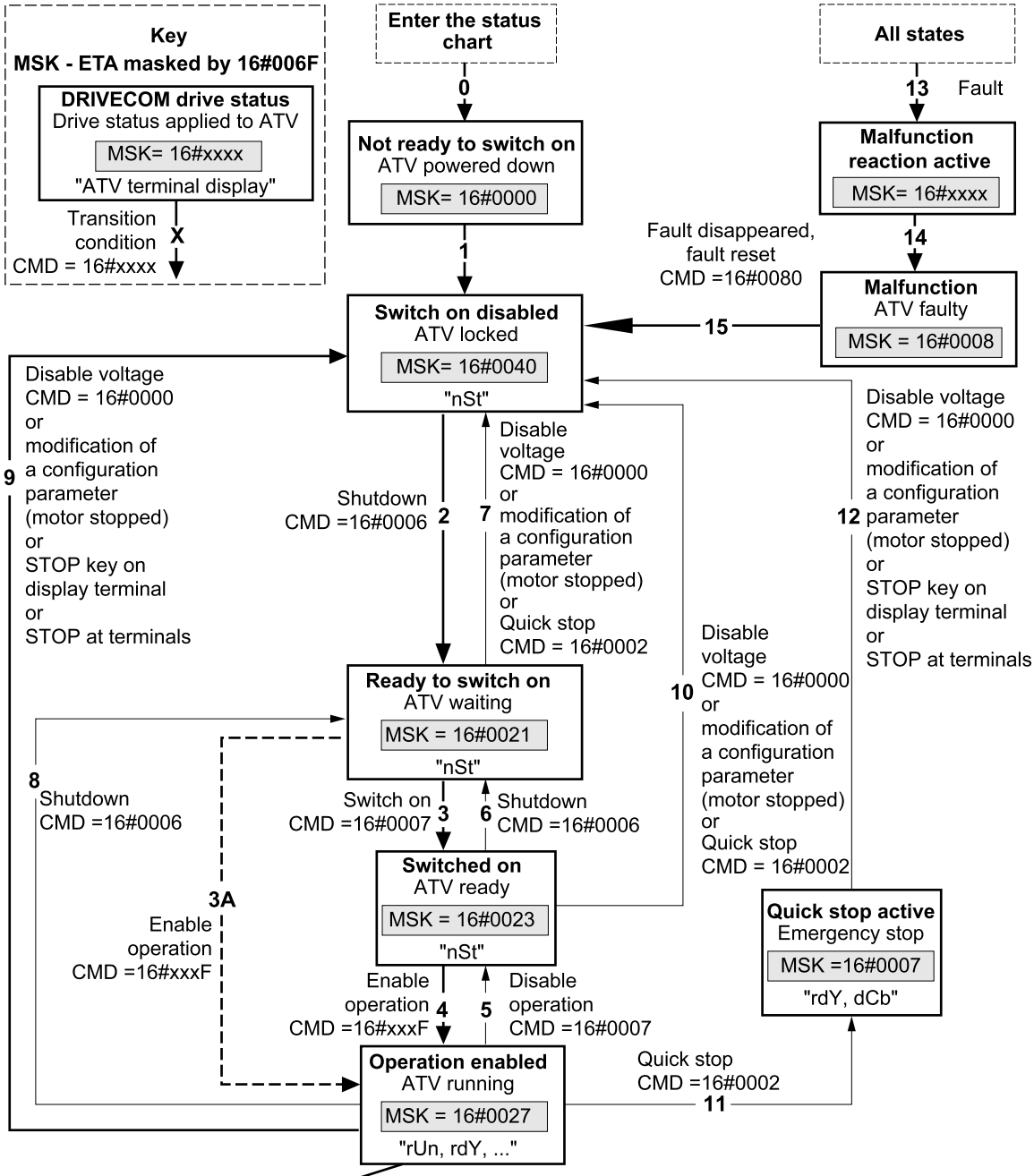
(1) Unless the PSt parameter has been set to "NO"

Communication bus monitoring

The drive behaviour in the event of loss of communication can be configured via the "SLL" parameter (page 50) for Modbus or the "COL" parameter (page 50) for CANopen. This configuration is saved if the power supply is disconnected.
In its factory setting, loss of communication triggers a fault (COF for CANopen or SLF for Modbus) with freewheel stopping.

Bit 14 (NTO) of "Extended control word (CMI)" is also used to inhibit Modbus communication monitoring. Even if communication monitoring is inhibited, certain CMI bits automatically change to 0 at the end of the time-out. This configuration is not saved if the power supply is disconnected.
For safety reasons, inhibiting the communication fault should be restricted to the debug phase or to special applications.

DRIVECOM status chart



Examples:	Examples (default configuration):
ETA = 16#0627 : Normal stop or Forward operation, speed reached	CMD = 16#000F : Forward operation
ETA = 16#8627 : Reverse operation, speed reached	CMD = 16#080F : Reverse operation
ETA = 16#0227 : Forward operation, ACC or DEC	CMD = 16#100F : Stop (configured by "Stt")
ETA = 16#8227 : Reverse operation, ACC or DEC	CMD = 16#200F : DC injection stop
	CMD = 16#400F : Fast stop

Exiting the "Operation enabled" status via a "Disable voltage" (9) or "Shutdown" (8) command causes a freewheel stop.

Supervision and control in LINE mode

The Altivar control process using the communication bus conforms to the CANopen DS402 profile status chart compatible with the DRIVECOM standard. Each state represents an aspect of the internal behaviour of the drive.

This chart evolves according to whether the control word is sent (CMD W8501) or an event occurs (example: lock following malfunction). The drive status can be identified by the value of the status word (ETA W3201).

Not ready to switch on (Initialization):

Communication is being initialized.
Transient state invisible to the communication bus.

Switch on disabled (Configuration):

Initialization of the drive is complete.
The configuration and adjustment parameters can be modified.
If all or part of the configuration and settings are to be loaded, we recommend disabling the consistency check function during the transfer (CMI W8504, bit 15 = 1). On completion of the transfer, the consistency check must be enabled (CMI W8504, bit 15 = 0).
The drive is locked.

Ready to switch on and Switched on (Drive initialized):

The drive is locked.
The power stage of the drive is ready to operate, but voltage has not yet been applied to the output.
The configuration and adjustment parameters can be modified, but modifying a configuration parameter returns the drive to the "Switch on disabled" state.

Operation enabled (Operational):

The drive is unlocked and voltage can be applied to the motor terminals.
Auto-tuning (tUn) requires an injection of current. The drive must therefore be in this state to perform this command.
The adjustment parameters can be modified even if a run command or a DC injection current is present. However, a configuration parameter can only be modified if the motor is stopped, and this returns the drive to the "Switch on disabled" state.

Quick stop active (Emergency stop active):

Fast stop
Restarting is only possible after the drive has changed to the "Switch on disabled" state.

Malfunction reaction active (Reaction on fault):

Transient state during which the drive performs an action appropriate to the type of fault.

Malfunction (Fault):

The drive is locked.

Difference between a fast stop and a Quick stop

A fast stop (CMD = 16#400F) is a stop on a short ramp that maintains the drive in the "Operation enabled" state.
The drive remains locked after a fast stop.
A run command can be executed immediately after a fast stop.

A Quick stop (CMD = 16#0002) is an emergency stop that causes a stop on a short ramp followed by locking in the "Quick stop active" state.
To be able to restart the drive, you must first change to the "Switch on disabled" state via the "Disable voltage" command (CMD = 16#0000).
It is not possible, therefore, to execute a run command immediately after a Quick stop.

CAUTION
In access level "L1" or "L2" (parameter "LAC"):
- Priorities between channels are managed by the drive.
- At switch-on, the drive is in control via the terminals and changes automatically to the "Operation enabled" state. This means that, when a run command is applied (for example: CMD = 16#000F), it starts without needing to follow the Drivecom status chart procedure.

When the drive is controlled via a communication bus, it is advisable to configure the access level "LAC" = "L3":
- The active channel is set by configuring the following parameters: "mixed mode (CHCF)", "reference switching (rFC)", "control switching (CCS)", "configuration of control channel 1 (Cd1)", "configuration of control channel 2 (Cd2)", "configuration of reference 1 (Fr1)" and "configuration of reference 2 (Fr2)".
- At switch-on, the drive configured for control via the bus changes to the "Switch on disabled" state. This means that it must follow the Drivecom status chart procedure to be able to start, and so prevent any unwanted behaviour.

CMD control word (W8501)

bit 7	bit 6	bit 5	bit 4	bit 3	bit 2	bit 1	bit 0
Fault reset	0	0	0	Enable operation	Quick stop (active at 0)	Enable voltage	Switch on

bit 15	bit 14	bit 13	bit 12	bit 11	bit 10	bit 9	bit 8
(1)	(1)	(1)	(1)	(1)	0	0	0

(1) This bit action depends on the LAC "Access levels" parameter and the functions configured by the user.
For example, to use bit 15 to switch the ramp, simply configure LAC = L3 (Access to advanced functions and management of mixed modes) and set the "Ramp switching rPS" configuration parameter to Cd15.

Command	Transition address	Final state	bit 7	bit 3	bit 2	bit 1	bit 0	Typical value of CMD (W8501)
			Reset	Enable operation	Quick stop	Enable voltage	Switch on	
Shut down	2, 6, 8	Ready to switch on	x	x	1	1	0	16#0006
Switch on	3	Switched on	x	x	1	1	1	16#0007
Enable operation	4	Operation enabled	x	1	1	1	1	16#000F
Disable operation	5	Switched on	x	0	1	1	1	16#0007
Disable voltage	7, 9, 10, 12	Switch on disabled	x	x	x	0	x	16#0000
Quick stop	11	Quick stop active	x	x	0	1	x	16#0002
	7, 10	Switch on disabled						
Fault reset	15	Switch on disabled	0 → 1	x	x	x	x	16#0080

x: State not significant
0 → 1: Change from 0 to 1

ETA status word (W3201)

bit 7	bit 6	bit 5	bit 4
Alarm	Switch on disabled	Quick stop active at 0	0 (1) (2)

bit 3	bit 2	bit 1	bit 0
Malfunction	Operation enabled	Switched on	Ready to switch on

bit 15	bit 14	bit 13	bit 12
Direction of rotation	Stop via STOP key	0	0

bit 11	bit 10	bit 9	bit 8
Reference exceeded	Reference reached	Forced local mode (active at 0)	0

State	bit 6	bit 5	bit 3	bit 2	bit 1	bit 0	MSK = ETA (W3201) masked by 16#006F
	Switch on disabled	Quick stop	Malfunction	Operation enabled	Switched on	Ready to switch on	
Not ready to switch on	0	x (2)	0	0	0	0	16#0000 16#0020
Switch on disabled	1	x (2)	0	0	0	0	16#0040 16#0060
Ready to switch on	0	1	0	0	0	1	16#0021
Switched on	0	1	0	0	1	1	16#0023
Operation enabled	0	1	0	1	1	1	16#0027
Malfunction	0	x (2)	1	0	0	0	16#0008 16#0028
Malfunction reaction active	0	x (2)	1	1	1	1	16#000F 16#002F
Quick stop active	0	0	0	1	1	1	16#0007

x: State not significant

(1) Bit 4 of the ETA status word corresponds to DRIVECOM's "Voltage disabled".
(2) We recommend that you do not test this bit, so as to ensure compatibility with future versions.

Function compatibility

Incompatible functions

The following functions will be inaccessible or deactivated in the cases described below:

Automatic restart

This is only possible for 2-wire level detection control (tCC = 2C and tCt = LEL or PFO).

Flying restart

This is only possible for 2-wire level detection control (tCC = 2C and tCt = LEL or PFO).
This function is locked if automatic injection on stopping is configured as DC (AdC = Ct).

Reverse

On the ATV31●●●A range only, this function is locked if local control is active (tCC = LOC).

Function compatibility table

The choice of application functions may be limited by the number of I/O and by the fact that some functions are incompatible with one another. Functions which are not listed in this table are fully compatible.
If there is an incompatibility between functions, the first function configured will prevent the remainder being configured.

To configure a function, first check that functions which are incompatible with it are unassigned, especially those which are assigned in the factory settings.

	Summing inputs (factory setting)	+/- speed (1)	Management of limit switches	Preset speeds (factory setting)	PI regulator	Jog operation	Brake control	DC injection stop	Fast stop	Freewheel stop
Summing inputs (factory setting)		●		↑	●	↑				
+/- speed (1)	●			●	●	●				
Management of limit switches					●					
Preset speeds (factory setting)	←	●			●	↑				
PI regulator	●	●	●	●		●	●			
Jog operation	←	●		←	●		●			
Brake control					●	●		●		
DC injection stop							●			↑
Fast stop										↑
Freewheel stop								←	←	

(1) Excluding special application with reference channel Fr2.

● Incompatible functions Compatible functions N/A

Priority functions (functions which cannot be active at the same time):

← ↑ The function indicated by the arrow has priority over the other.

Stop functions have priority over run commands.
Speed references via logic command have priority over analog references.

Function compatibility

Logic and analog input application functions

Each of the functions on the following pages can be assigned to one of the inputs.
A single input can activate several functions at the same time (reverse and 2nd ramp for example). **The user must therefore ensure that these functions can be used at the same time.**
The SUP- display menu (parameters LIA and AIA) can be used to display the functions assigned to each input in order to check their compatibility.

Before assigning a reference, a command or a function to a logic or analog input, check that this input has not already been assigned in the factory settings, and that no other input has been assigned to an incompatible or unwanted function.

- Example of incompatible function to be unassigned:
  To activate "+/- speed", first unassign the preset speeds and summing input 2.

- Example of unwanted function to be unassigned:
  To control an ATV31●●●A at the terminals it is advisable to unassign the potentiometer and the RUN button.

The following table indicates the factory-set input assignments and the procedure for unassigning them.

Assigned input		Function	Code	To unassign, set to:	Page
ATV31●●●	ATV31●●●A				
LI2		Reverse	rrS	nO	30
LI3	LI3	2 preset speeds	PS2	nO	39
LI4	LI4	4 preset speeds	PS4	nO	39
AI1		Reference 1	Fr1	Anything but AI1	32
	RUN button	Forward	tCC	2C or 3C	30
	AIP (potentiometer)	Reference 1	Fr1	Anything but AIP	32
AI2	AI2	Summing input 2	SA2	nO	38

DRIVECOM variables

Modbus address	CANopen address	Code	Read/ Write	Name/Description/Possible values
8601	6040	**CMDD**	R/W	**DRIVECOM control word** Identical to CMD (page 15). bit 0: "Switch on": active at 1 bit 1: "Disable Voltage": active at 0 bit 2: "Quick Stop": active at 0 bit 3: "Enable Operation": active at 1 bits 4 to 6: Reserved: set to 0 bit 7: Fault reset: active on rising edge 0 -> 1 bits 8 to 10: Reserved: set to 0 For "Access level" LAC (page 32) = L1 or L2: bit 11 = 0: Forward direction command bit 11 = 1: Reverse direction command bit 12 = 0: No action bit 12 = 1: Stop command depending on the Stt "Stop type" parameter bit 13 = 0: No action bit13 = 1: Injection stop command bit 14 = 0: No action bit14 = 1: Fast stop command bit 15: Reserved: set to 0 For "Access level" LAC (page 32) = L3: Factory assignments bit 11 = 0: Forward direction command bit 11 = 1: Reverse direction command bit 12 = 0: No action bit 12 = 1: Stop command depending on the Stt "Stop type" parameter bit 13: No action bit 14: No action bit 15: No action Bits 11 to 15 can be assigned to the following functions: Ramp switching (rPS) Fast stop (FSt) DC injection (DCI) 2 preset speeds (PS2) 4 preset speeds (PS4) 8 preset speeds (PS8) 16 preset speeds (PS16) 2 preset PI references (Pr2) 4 preset PI references (Pr4) Switching for 2nd current limit (LC2) Switching, motor 2 (CHP) External fault (EtF) For example, to use bit 15 to switch the ramp, simply set the "Ramp switching" rPS configuration parameter (page 36) to Cd15.
8602	6042	**LFRD**	R/W	**Speed reference via the bus (signed value)** **DSP402: vl target velocity** **DRIVECOM: Nominal speed value** Unit: • 1 = 1 rpm if bit 9 of CMI (page 16) = 0 • 1 ≈ 0.018 Hz (resolution 32767 points = 600 Hz) if bit 9 of CMI = 1

DRIVECOM variables

Modbus address	CANopen address	Code	Read/ Write	Name/Description/Possible values
8603	6041	**ETAD**	R	**DRIVECOM status word** Identical to ETA (page 17). bit 0: Ready to switch on bit 1: Switched on bit 2: Operation enabled bit 3 = 0: No fault bit 3 = 1: Malfunction, fault present (FAI) bit 4: Voltage disabled bit 5: Quick stop bit 6: Switch on disabled bit 7 = 0: No alarm bit 7 = 1: Alarm present bit 8: Reserved bit 9 = 0: Forced local mode in progress (FLO) bit 9 = 1: No forced local mode bit 10 = 0: Reference not reached (transient state) bit 10 = 1: Reference reached (steady state) bit 11 = 0: LFRD reference normal bit 11 = 1: LFRD reference exceeded (< LSP or > HSP) Caution: LFRD is expressed in rpm, LSP and HSP in Hz bits 12 and 13: Reserved bit 14 = 0: No stop imposed by STOP key on built-in keypad (ATV31...A) or on the remote display terminal bit 14 = 1: Stop imposed by STOP key on built-in keypad (ATV31...A) or on the remote display terminal bit 15 = 0: Forward rotation (output frequency) bit 15 = 1: Reverse rotation (output frequency)
8605	6043	**FRHD**	R	**Speed reference (signed ramp input)** **DSP402: vl velocity demand** **DRIVECOM: Reference speed variable** Unit: 1 rpm
8604	6044	**RFRD**	R	**Output speed (signed value)** **DSP402: vl control effort** **DRIVECOM: Actual speed value** Unit: • 1 = 1 rpm if bit 9 of CMI (page 16) = 0 • 1 ≈ 0.018 Hz (resolution 32767 points = 600 Hz) if bit 9 of CMI = 1
8606	603F	**ERRD**	R	**Fault code** **DSP402: Error code** **DRIVECOM: Malfunction code** 0000H = "nOF": No fault saved 1000H = "CrF": Capacitor pre-charge fault or = "OLF": Motor overload fault or = "SOF": Motor overspeed fault 2310H = "OCF": Overcurrent fault 2320H = "OCF": Impeding short-circuit fault or = "OCF": Power module fault, specific to ATV31●D15● 2330H = "SCF": Motor short-circuit fault (to earth) 2340H = "OCF": Motor short-circuit fault (phase to phase) 3110H = "OSF": Line supply overvoltage fault 3120H = "USF": Line supply undervoltage fault 3130H = "PHF": Line supply phase loss fault 3310H = "ObF": DC bus overvoltage fault or = "OPF": Motor phase loss fault or = "OPF": Motor phase loss fault - 3 phases 4210H = "OHF": Drive overheating fault 5520H = "EEF": EEPROM memory fault 6100H = "InF": Internal fault 6300H = "CFF": Configuration (parameters) incorrect or = "CFI": Configuration (parameters) invalid 7300H = "LFF": 4 - 20 mA fault on AI3 7510H = "SLF": Modbus communication fault 8100H = "COF": CANopen communication fault 9000H = "EPF": External fault FF00H = "tnF": Auto-tuning fault FF01H = "bLF": Brake control fault

DRIVECOM variables

Modbus address	CANopen address	Code	Read/ Write	Name/Description/Possible values
8607 - 8608	6046 / 1	**SMIL**	R/W	**Min. speed** **DSP402: vl velocity min amount** **DRIVECOM: Speed min amount** Low speed, equivalent to LSP (page 24), but in rpm Unit: 1 rpm 32-bit word (low order: 8607, high order: 8608) Adjustment range: 0 to HSP (page 24)
8609 - 8610	6046 / 2	**SMAL**	R/W	**Max. speed** **DSP402: vl velocity max amount** **DRIVECOM: Speed max amount** High speed, equivalent to HSP (page 24), but in rpm Unit: 1 rpm 32-bit word (low order: 8609, high order: 8610) Adjustment range: LSP (page 24) to tFR (page 28)
8611 - 8612	6048 / 1	**SPAL**	R/W	**Acceleration - Speed delta** Speed for calculation of acceleration ramp Unit: 1 rpm 32-bit word (low order: 8611, high order: 8612) Adjustment range: 1 to 65535
8613	6048 / 2	**SPAT**	R/W	**Acceleration - Time delta** Time for calculation of acceleration ramp (time to go from 0 to SPAL) Unit: 1 s Adjustment range: 0 to 65535
8614 - 8615	6049 / 1	**SPDL**	R/W	**Deceleration - Speed delta** Speed for calculation of deceleration ramp Unit: 1 rpm 32-bit word (low order: 8614, high order: 8615) Adjustment range: 1 to 65535
8616	6049 / 2	**SPDT**	R/W	**Deceleration - Time delta** Time for calculation of deceleration ramp (time to go from SPDL to 0) Unit: 1 s Adjustment range: 0 to 65535

Control variables

Modbus address	CANopen address	Code	Read/ Write	Name/Description/Possible values
8501	2037 / 2	**CMD**	R/W	**Control word** bit 0: "Switch on": active at 1 bit 1: "Disable Voltage": active at 0 bit 2: "Quick Stop": active at 0 bit 3: "Enable Operation": active at 1 bits 4 to 6: Reserved: set to 0 bit 7: Fault reset: active on rising edge 0 -> 1 bits 8 to 10: Reserved: set to 0 For "Access level" LAC (page 32) = L1 or L2: bit 11 = 0: Forward direction command bit 11 = 1: Reverse direction command bit 12 = 0: No action bit 12 = 1: Stop command depending on the Stt "Stop type" parameter bit 13 = 0: No action bit13 = 1: Injection stop command bit 14 = 0: No action bit14 = 1: Fast stop command bit 15: Reserved: set to 0 For "Access level" LAC (page 32) = L3: Factory assignments bit 11 = 0: Forward direction command bit 11 = 1: Reverse direction command bit 12 = 0: No action bit 12 = 1: Stop command depending on the Stt "Stop type" parameter bit 13: No action bit 14: No action bit 15: No action Bits 11 to 15 can be assigned to the following functions: Ramp switching (rPS) Fast stop (FSt) DC injection (DCI) 2 preset speeds (PS2) 4 preset speeds (PS4) 8 preset speeds (PS8) 16 preset speeds (PS16) 2 preset PI references (Pr2) 4 preset PI references (Pr4) Switching for 2nd current limit (LC2) Switching, motor 2 (CHP) External fault (EtF) For example, to use bit 15 to switch the ramp, simply set the "Ramp switching" rPS configuration parameter (page 36) to Cd15.
8502	2037 / 3	**LFr**	R/W	**Frequency reference via the bus (signed value)** Unit: • 1 = 0.1 Hz if bit 9 of CMI (page 16) = 0 • 1 ≈ 0.018 Hz (resolution 32767 points = 600 Hz) if bit 9 of CMI = 1
8503	2037 / 4	**PISP**	R/W	**PI regulator reference via the bus** Unit: 0.1% Adjustment range: 0 to 1000

Control variables

Modbus address	CANopen address	Code	Read/ Write	Name/Description/Possible values
8504	2037 / 5	**CMI**	R/W	**Extended control word** bit 0 = 0: No action bit 0 = 1: Recall factory settings command (1). This bit automatically resets to 0 when the request is taken into account. It is only active when the drive has come to a complete stop: ETI.4 = ETI.5 = 0. bit 1 = 0: No action bit 1 = 1: Save configuration/adjustments in EEPROM (2) if voltage is sufficient (no USF fault). This bit automatically resets to 0 when the request is taken into account. During saving (ETI.0 = 1), parameters cannot be written. bit 2: Reserved bit 3 = 0: No action bit 3 = 1: External fault. The drive's behaviour during an external fault is defined by parameter EPL (see page 49). bit 4 = 0: No action bit 4 = 1: Ramp switching command bits 4 to 8: Reserved bit 9 = 0: Normal resolution (references, output speed and ouput frequency in physical units: rpm and Hz) bit 9 = 1: High resolution (references, output speed and ouput frequency in 32767 points for 600 Hz) bits 10 to 12: Reserved bit 13 = 0: Drive not locked on standstill bit 13 = 1: Drive locked on standstill bit 14 = 0: Control with Modbus communication monitoring bit 14 = 1: Control with no Modbus communication monitoring (NTO) ⚠ For safety reasons, inhibiting the Modbus communication fault (NTO) should be restricted to the debug phase or to special applications. bit 15 = 0: Parameter consistency check bit 15 = 1: No parameter consistency check + drive locked on standstill (switching this bit to 0 will revalidate all parameters)
5240	2016 / 29	**IOLR**	R/W	**Value of logic I/O** (0 = inactive, 1 = active) bits 0 to 7: Not accessible in write mode bit 8: Value of "R1" relay output, accessible in write mode if R1 is not assigned bit 9: Value of "R2" relay output, accessible in write mode if R2 is not assigned bit 10: Value of "LO" logic output, accessible in write mode if LO is not assigned bits 11 to 13: Reserved bit 14: Not accessible in write mode bit 15: Reserved
5261	2016 / 3E	**AO1R**	R/W	**Value of the analog output** AO1R is accessible in write mode if dO (page 31) is not assigned Variation range: 0 to 10000 The value 10000 corresponds to 10V if AO1t = 10U, or to 20 mA if AO1t = OA or 4A (page 30)

(1) The following configuration and adjustment parameters do not revert to their factory settings; they retain their current configuration:
- bFr (Standard motor frequency) page 26
- LCC (Control via remote display terminal) page 34
- COd (Terminal locking code) page 52
- Communication parameters, page 51

(2) **Caution:** the EEPROM life limit is 1,000,000 write operations.

Monitoring variables

Modbus address	CANopen address	Code	Read/ Write	Name/Description/Possible values
3201	2002 / 2	**ETA**	R	**Status word** bit 0: Ready to switch on bit 1: Switched on bit 2: Operation enabled bit 3 = 0: No fault bit 3 = 1: Malfunction, fault present (FAI) bit 4: Voltage disabled (still equals 0) bit 5: Quick stop bit 6: Switch on disabled bit 7 = 0: No alarm bit 7 = 1: Alarm present bit 8: Reserved bit 9 = 0: Forced local mode in progress (FLO) bit 9 = 1: No forced local mode bit 10 = 0: Reference not reached (transient state) bit 10 = 1: Reference reached (steady state) bit 11 = 0: LFRD reference normal bit 11 = 1: LFRD reference exceeded (< LSP or > HSP) Caution: LFRD is expressed in rpm, LSP and HSP in Hz bits 12 and 13: Reserved bit 14 = 0: No stop imposed by STOP key on built-in keypad (ATV31...A) or on the remote display terminal bit 14 = 1: Stop imposed by STOP key on built-in keypad (ATV31...A) or on the remote display terminal bit 15 = 0: Forward rotation (output frequency) bit 15 = 1: Reverse rotation (output frequency)
3202	2002 / 3	**rFr**	R	**Output frequency applied to the motor (signed value)** Unit: • 1 = 0.1 Hz if bit 9 of CMI (page 16) = 0 • 1 ≈ 0.018 Hz (resolution 32767 points = 600 Hz) if bit 9 of CMI = 1
3203	2002 / 4	**FrH**	R	**Frequency reference before ramp (absolute value)** Unit: 0.1 Hz
3204	2002 / 5	**LCr**	R	**Current in the motor** Unit: 0.1 A
3205	2002 / 6	**Otr**	R	**Motor torque** Unit: 1% 100% = Nominal motor torque, calculated using the configuration parameters.
3211	2002 / C	**OPr**	R	**Motor power** Unit: 1% 100% = Nominal motor power, calculated using the configuration parameters.
3207	2002 / 8	**ULn**	R	**Line voltage** Unit: 0.1 V (gives the line voltage via the DC bus, motor running or stopped)
3209	2002 / A	**tHd**	R	**Drive thermal state** Unit: 1% 100% = Nominal thermal state 118% = "OHF" threshold (drive overheating)
3210	2002 / B	**TDM**	R	**Max. thermal state reached by the drive** Unit: 1% 100% = Nominal thermal state 118% = "OHF" threshold (drive overheating) Automatically reset to zero when the drive is powered down.
9630	2042 / 1F	**tHr**	R	**Motor thermal state** Unit: 1% 100% = Nominal thermal state 118% = "OLF" threshold (motor overload)
3231	2002 / 20	**rtH**	R	**Operating time** Unit: 1 Hour Factory setting: 0 Adjustment range: 0 to 65535 Total time the motor has been powered up. Can be reset to zero by the rPr parameter (see page 51).

Monitoring variables

Modbus address	CANopen address	Code	Read/ Write	Name/Description/Possible values
12002	205A / 3	**USPL**	R	**Motor speed in customer units - Low order** Unit: 1 USPL/USPH = rFr x SdS on 32 bits (see pages 17 and 26).
12003	205A / 4	**USPH**	R	**Motor speed in customer units - High order** Unit: 1 USPL/USPH = rFr x SdS on 32 bits (see pages 17 and 26).
3206	2002 / 7	**ETI**	R	**Extended status word** bit 0 = 0: Write parameters authorized bit 0 = 1: Write parameters not authorized (the drive is in the process of saving the current parameters from the RAM to the EEPROM) bit 1 = 0: No parameter consistency check + drive locked on standstill bit 1 = 1: Parameter consistency check bit 2 = 0: Fault reset not authorized bit 2 = 1: Fault reset authorized bit 3: Reserved bit 4 = 0: Motor stopped bit 4 = 1: Motor running bit 5 = 0: No DC injection bit 5 = 1: DC injection bit 6 = 0: Drive in steady state bit 6 = 1: Drive in transient state bit 7 = 0: No motor thermal overload alarm bit 7 = 1: Motor thermal overload alarm bit 8 = 0: No alarm if excessive braking bit 8 = 1: Alarm if excessive braking bit 9 = 0: Drive not accelerating bit 9 = 1: Drive accelerating bit 10 = 0: Drive not decelerating bit 10 = 1: Drive decelerating bit 11 = 0: No current limit alarm bit 11 = 1: Current limit alarm bit 12 = 0: Fast stop not in progress bit 12 = 1: Fast stop in progress bit 14 = 0 and bit 13 = 0: ATV controlled via terminal block or built-in keypad (ATV31....A) bit 14 = 0 and bit 13 = 1: ATV controlled via the remote display terminal bit 14 = 1 and bit 13 = 0: ATV controlled via ModBus bit 14 = 1 and bit 13 = 1: ATV controlled via CanOpen bit 15 = 0: Forward rotation requested (reference) bit 15 = 1: Reverse rotation requested (reference)
3250	2002 / 33	**LRS1**	R	**Extended status word No. 1** bit 0: Reserved bit 1 = 0: No drive fault bit 1 = 1: Drive fault bit 2 = 0: Motor stopped bit 2 = 1: Motor running bit 3: Reserved bit 4 = 0: Frequency threshold (Ftd) not reached bit 4 = 1: Frequency threshold (Ftd) reached bit 5 = 0: High speed not reached bit 5 = 1: High speed reached bit 6 = 0: Current threshold (Ctd) not reached bit 6 = 1: Current threshold (Ctd) reached bit 7 = 0: Speed reference not reached bit 7 = 1: Speed reference reached bit 8 = 0: No motor thermal overload alarm bit 8 = 1: Motor thermal overload alarm bit 9 = 0: No brake control (brake engaged) bit 9 = 1: Brake control in progress (brake released) bits 10 and 11: Reserved bit 12 = 0: No loss of 4-20 mA fault bit 12 = 1: Loss of 4-20 mA fault bit 13: Reserved bit 14 = 0: No drive thermal overload alarm bit 14 = 1: Drive thermal overload alarm bit 15: Reserved

Monitoring variables

Modbus address	CANopen address	Code	Read/ Write	Name/Description/Possible values
3252	2002 / 35	**LRS3**	R	**Extended status word No. 3** bit 0 = 0: The reference is given by Fr1 bit 0 = 1: The reference is given by Fr2 bit 1 = 0: The command is given by Fr1 or Cd1 bit 1 = 1: The command is given by Fr2 or Cd2 bit 2 = 0: ACC and DEC are used as ramp parameters bit 2 = 1: ACC2 and DEC2 are used as ramp parameters bit 3 = 0: CLI is used for current limiting bit 3 = 1: CL2 is used for current limiting bits 4 to 10: Reserved bit 11 = 0: Motor 1 is not used bit 11 = 1: Motor 1 is used bit 12 = 0: Motor 2 is not used bit 12 = 1: Motor 2 is used bits 13 to 15: Reserved
5240	2016 / 29	**IOLR**	R	**Value of logic I/O** (0 = inactive, 1 = active) bit 0: Value of logic input "LI1" bit 1: Value of logic input "LI2" bit 2: Value of logic input " LI3" bit 3: Value of logic input " LI4" bit 4: Value of logic input " LI5" bit 5: Value of logic input " LI6" bit 6: Reserved bit 7: Keypad presence: 0 = absent, 1 = present bit 8: Value of "R1" relay output, also accessible in write mode if R1 is not assigned bit 9: Value of "R2" relay output, also accessible in write mode if R2 is not assigned bit 10: Value of "LO" logic output, also accessible in write mode if LO is not assigned bit 11: Reserved bit 12: Reserved bit 13: Reserved bit 14: 0 = AOC/AOV logic output, 1 = AOC/AOV analog output bit 15: Reserved
5241	2016 / 2A	**AIPC**	R	**Value of analog input AIP (ATV31….A drive potentiometer)** Unit: 1 mV Variation range: 0 to 10000
5242	2016 / 2B	**AI1C**	R	**Value of analog input AI1** Unit: 1 mV Variation range: 0 to 10000
5243	2016 / 2C	**AI2C**	R	**Value of analog input AI2** Unit: 1 mV Variation range: -10000 to 10000
5244	2016 / 2D	**AI3C**	R	**Value of analog input AI3** Unit: 1 µA Variation range: 0 to 20000
5261	2016 / 3E	**AO1R**	R	**Value of the analog output** AO1R is also accessible in write mode if dO (page 31) is not assigned Variation range: 0 to 10000 The value 10000 corresponds to 10V if AO1t = 10U, or to 20 mA if AO1t = OA or 4A (page 30)

Monitoring variables

Modbus address	CANopen address	Code	Read/ Write	Name/Description/Possible values
7121	2029 / 16	**LFt**	R	**Last fault** The fault remains saved even if the fault disappears, and even after switching the drive off then on again. 0 = "nOF": No fault saved 3 = "CFF": Configuration (parameters) incorrect 4 = "CFI": Configuration (parameters) invalid 5 = "SLF": Modbus communication fault 8 = "EPF": External fault 9 = "OCF": Overcurrent fault 10 = "CrF": Capacitor pre-charge fault 13 = "LFF": 4 - 20 mA fault on AI3 16 = "OHF": Drive overheating fault 17 = "OLF": Motor overload fault 18 = "ObF": DC bus overvoltage fault 19 = "OSF": Line supply overvoltage fault 20 = "OPF": Motor phase loss fault 21 = "PHF": Line supply phase loss fault 22 = "USF": Line supply undervoltage fault 23 = "OCF": Motor short-circuit fault (phase to phase) 24 = "SOF": Motor overspeed fault 25 = "tnF": Auto-tuning fault 26 to 29 = "InF": Internal fault 30 = "EEF": EEPROM memory fault 31 = "OCF": Impeding short-circuit fault 32 = "SCF": Motor short-circuit fault (to earth) 33 = "OPF": Motor phase loss fault - 3 phases 34 = "COF": Communication fault line 2 (CANopen) 35 = "bLF": Brake control fault 36 = "OCF": Power module fault, specific to ATV31●D15● 55 = "SCF": Power module fault or motor short-circuit fault, detected at power up.
7201	202A / 2	**DP1**	R	**Past fault No. 1** (Same format as "LFt" page 20)
7202	202A / 3	**DP2**	R	**Past fault No. 2** (Same format as "LFt" page 20)
7203	202A / 4	**DP3**	R	**Past fault No. 3** (Same format as "LFt" page 20)
7204	202A / 5	**DP4**	R	**Past fault No. 4** (Same format as "LFt" page 20)

Monitoring variables

Modbus address	CANopen address	Code	Read/ Write	Name/Description/Possible values
7211	202A / C	**EP1**	R	**Status of past fault No. 1** bit 0 = Same as ETA.1: - 0: Drive not ready - 1: Drive ready (RDY) bit 1 = Same as ETA.5: - 0: Emergency stop in progress - 1: No emergency stop bit 2 = Same as ETA.6: - 0: No SWITCH ON DISABLED status - 1: SWITCH ON DISABLED status bit 3 = Same as ETA.9: Reserved bit 4 = Same as ETA.15: - 0: Forward rotation (output frequency) - 1: Reverse rotation (output frequency) bit 5 = Same as ETI.4: - 0: Motor stopped - 1: Motor running bit 6 = Same as ETI.5: - 0: No DC injection - 1: DC injection bit 7 = Same as ETI.7: - 0: No motor thermal overload alarm - 1: Motor thermal overload alarm bit 8 = Same as ETI.8: Reserved bit 9 = Same as ETI.9: - 0: Drive not accelerating - 1: Drive accelerating bit 10 = Same as ETI.10: - 0: Drive not decelerating - 1: Drive decelerating bit 11 = Same as ETI.11: - 0: No current limit alarm - 1: Current limit alarm bit 12 = Same as ETI.12: Reserved bits 13 and 14 = Same as ETI.13 and ETI.14: - bit 14 = 0 and bit 13 = 0: ATV controlled via terminal block or built-in keypad (ATV31....A) - bit 14 = 0 and bit 13 = 1: ATV controlled via the remote display terminal - bit 14 = 1 and bit 13 = 0: ATV controlled via ModBus - bit 14 = 1 and bit 13 = 1: ATV controlled via CanOpen bit 15 = Same as ETI.15: - 0: Forward rotation requested (reference) - 1: Reverse rotation requested (reference)
7212	202A / D	**EP2**	R	**Status of past fault No. 2** (Same format as "EP1")
7213	202A / E	**EP3**	R	**Status of past fault No. 3** (Same format as "EP1")
7214	202A / F	**EP4**	R	**Status of past fault No. 4** (Same format as "EP1")
6056	201E / 39	**ErCO**	R	**CANopen: error word** Unit: 1 Range: 0 to 4 0: "No error" 1: "Bus off error" 2: "Life time error" 3: "CAN overrun" 4: "Heartbeat error"
8541	2037 / 2A	**CMI1**	R	**Image of Modbus extended control word** (received by the Modbus channel) Identical to CMI (page 16).

Monitoring variables

Modbus address	CANopen address	Code	Read/ Write	Name/Description/Possible values
8542	2037 / 2B	**CMI2**	R	**Image of CANopen extended control word** (received by the CANopen channel) Identical to CMI (page 16).
8521	2037 / 16	**LFR1**	R	**Image of Modbus frequency reference** (received by the Modbus channel) Identical to LFr (page 15).
8522	2037 / 17	**LFR2**	R	**Image of CANopen frequency reference** (received by the CANopen channel) Identical to LFr (page 15).
8631	2038 / 20	**LFD1**	R	**Image of Modbus speed reference** Speed reference received by the Modbus channel Identical to LFRD (page 12)
8632	2038 / 21	**LFD2**	R	**Image of CANopen speed reference** Speed reference received by the CANopen channel Identical to LFRD (page 12)
8531	2037 / 20	**PIR1**	R	**Image of Modbus PI reference** (received by the Modbus channel) Identical to PISP (page 15).
8532	2037 / 21	**PIR2**	R	**Image of CANopen PI reference** (received by the CANopen channel) Identical to PISP (page 15).

Identification variables

Modbus address	CANopen address	Code	Read/ Write	Name/Description/Possible values
3011	2000 / C	**NCV**	R	**Drive rating** 0 = unknown 1 = 018 (0.18 kW) 2 = 037 (0.37 kW) 3 = 055 (0.55 kW) 4 = 075 (0.75 kW) 5 = U11 (1.1 kW) 6 = U15 (1.5 kW) 7 = U22 (2.2 kW) 8 = U30 (3 kW) 9 = U40 (4 kW) 10 = U55 (5.5 kW) 11 = U75 (7.5 kW) 12 = D11 (11 kW) 13 = D15 (15 kW)
3012	2000 / D	**VCAL**	R	**Drive voltage** 0 = unknown 1 = M2 (200...240 V single phase) 2 = M3X (200...240 V 3-phase) 3 = N4 (380...500 V 3-phase) 4 = S6X (525...600 V 3-phase)
3017	2000 / 12	**INV**	R	**Nominal drive current** Unit: 0.1 A
3010	2000 / B	**ZON**	R	**Drive type** 0 = unknown 1 = ATV31……(drive without built-in keypad) 3 = ATV31……(drive with built-in keypad)
3401	2004 / 2	**TSP**	R	**Drive firmware type** The firmware type is specified by an ASCII letter "A": Standard firmware
3302	2003 / 3	**UdP**	R	**Drive firmware version** Coded on 2 bytes. - low order byte: firmware upgrade index (UI) in hexadecimal format - high order byte: firmware version (V) in hexadecimal format Example : For V1.2 IE04, UdP = 16#1204

Modbus address	CANopen address	Code	Read/ Write	Name/Description/Possible values
3105	2001 / 6	**LSP**	R/W	**Low speed** Unit: 0.1 Hz Factory setting: 0 Adjustment range: 0 to HSP (Motor frequency at min. reference)
3104	2001 / 5	**HSP**	R/W	**High speed** Unit: 0.1 Hz Factory setting: if bFr = 50: 500, if bFr = 60: 600 Adjustment range: LSP to tFr (Motor frequency at max. reference): Ensure that this setting is suitable for the motor and the application.
9622	2042 / 17	**ItH**	R/W	**Motor thermal protection - max. thermal current** Unit: 0.1 A Factory setting: According to drive rating Adjustment range: 0.2 to 1.5 In (1) Set ItH to the nominal current on the motor rating plate. Please refer to OLL on page 49 if you wish to suppress thermal protection. (1) In corresponds to the nominal drive current indicated in the Installation Manual and on the drive rating plate.
9623	2042 / 18	**UFr**	R/W	**IR compensation/Voltage boost** Unit: 1% Factory setting: 20 Adjustment range: 0 to 100 - For UFt (page 28) = n or nLd: IR compensation - For UFt = L or P: Voltage boost Used to optimize torque at very low speed (increase UFr if the torque is insufficient). Check that the value of UFr is not too high for when the motor is warm (risk of instability). ⚠ Modifying UFt (page 28) will cause UFr to return to the factory setting (20%).
9620	2042 / 15	**FLG**	R/W	**Frequency loop gain** Unit: 1% Factory setting: 20 Adjustment range: 1 to 100 Parameter active only if UFt (page 28) = n or nLd. The FLG parameter adjusts the following of the speed ramp on the basis of the inertia of the machine being driven. Too high a gain may result in operating instability.
9621	2042 / 16	**StA**	R/W	**Frequency loop stability** Unit: 1% Factory setting: 20 Adjustment range: 1 to 100 Parameter active only if UFt (page 28) = n or nLd. Used to adapt the return to steady state after a speed transient (acceleration or deceleration), according to the dynamics of the machine. Gradually increase the stability to avoid any overspeed.
9625	2042 / 1A	**SLP**	R/W	**Slip compensation** Unit: 1% Factory setting: 100 Adjustment range: 0 to 150 Parameter active only if UFt (page 28) = n or nLd. Used to adjust the slip compensation value fixed by nominal motor speed. The speeds given on motor rating plates are not necessarily exact. If slip setting < actual slip: the motor is not rotating at the correct speed in steady state. If slip setting > actual slip: the motor is overcompensated and the speed is unstable.
11301	2053 / 2	**JPF**	R/W	**Skip frequency** Unit: 0.1 Hz Factory setting: 0 Adjustment range: 0 to 5000 Prevents prolonged operation at a frequency range of ± 1 Hz around JPF. This function prevents a critical speed which leads to resonance. Setting the function to 0 renders it inactive.

Modbus address	CANopen address	Code	Read/ Write	Name/Description/Possible values
11302	2053 / 3	**JF2**	R/W	**2nd skip frequency** Unit: 0.1 Hz Factory setting: 0 Adjustment range: 0 to 5000 Prevents prolonged operation at a frequency range of ± 1 Hz around JF2. This function prevents a critical speed which leads to resonance. Setting the function to 0 renders it inactive.
9201	203E / 2	**CLI**	R/W	**Current limit** Unit: 0.1 A Factory setting: 1.5 In (1) Adjustment range: 0.25 to 1.5 In (1) Used to limit the torque and the temperature rise of the motor. (1) In corresponds to the nominal drive current indicated in the Installation Manual and on the drive rating plate.
11701	2057 / 2	**tLS**	R/W	**Low speed operating time** Unit: 0.1 s Factory setting: 0 (no time limit) Adjustment range: 0 to 9999 Following operation at LSP for a defined period, a motor stop is requested automatically. The motor restarts if the frequency reference is greater than LSP and if a run command is still present. Caution, value 0 corresponds to an unlimited time.
11003	2050 / 4	**Ftd**	R/WS	**Motor frequency threshold** Unit: 0.1 Hz Factory setting: bFr Adjustment range: 0 to 5000 Motor frequency threshold above which the relay contact (R1 or R2 = FtA) closes or output AOV = 10 V (dO = StA)
11002	2050 / 3	**ttd**	R/WS	**Motor thermal state threshold** Unit: 1% Factory setting: 100 Adjustment range: 0 to 118 Motor thermal state threshold above which the relay contact (R1 or R2 = tSA) closes or output AOV = 10 V (dO = tSA)
11001	2050 / 2	**Ctd**	R/WS	**Motor current threshold** Unit: 0.1 A Factory setting: In (1) Adjustment range: 0 to 1.5 In (1) Motor current threshold above which the relay contact (R1 or R2 = CtA) closes or output AOV = 10 V (dO = CtA) (1) In corresponds to the nominal drive current indicated in the Installation Manual and on the drive rating plate.

Modbus address	CANopen address	Code	Read/ Write	Name/Description/Possible values
12001	205A / 2	**SdS**	R/W	**USPL/USPH scale factor** (USPL/USPH = rFr x SdS) See USPL/USPH page 18. Unit: 0.1 Factory setting: 300 Adjustment range: 1 to 2000 This parameter also affects the display parameter SPd1/SPd2/SPd3 in the SUP- menu (See Programming Manual)
3015	2000 / 10	**bFr**	R/WS	**Standard motor frequency** Factory setting: 0 0 = "50" 1 = "60" 50 Hz: IEC 60 Hz: NEMA This parameter modifies the presets of the following parameters: HSP page 24, Ftd page 25, FrS page 26 and tFr page 28.
9601	2042 / 2	**UnS**	R/WS	**Nominal motor voltage given on the rating plate** Unit: 1 V Factory setting: According to drive rating Adjustment range according to drive rating: ATV31●●●M2: 100 to 240 V ATV31●●●M3X: 100 to 240 V ATV31●●●N4: 100 to 500 V ATV31●●●S6X: 100 to 600 V
9602	2042 / 3	**FrS**	R/WS	**Nominal motor frequency given on the rating plate** Unit: 0.1 Hz Factory setting: if bFr = 50: 500 if bFr = 60: 600 Adjustment range: 100 to 5000 ⚠ The ratio $\frac{\text{UnS (in volts)}}{\text{FrS (in Hz)}}$ must not exceed the following values: ATV31●●●M2: 7 max. ATV31●●●M3X: 7 max. ATV31●●●N4: 14 max. ATV31●●●S6X: 17 max.
9603	2042 / 4	**nCr**	R/WS	**Nominal motor current given on the rating plate** Unit: 0.1 A Factory setting: According to drive rating Adjustment range: 0.25 to 1.5 In (1) (1) In corresponds to the nominal drive current indicated in the Installation Manual and on the drive rating plate.

Modbus address	CANopen address	Code	Read/ Write	Name/Description/Possible values
9604	2042 / 5	**nSP**	R/WS	**Nominal motor speed given on the rating plate** Unit: 1 rpm Factory setting: According to drive rating Adjustment range: 0 to 32767 RPM 0 to 9999 RPM then 10.00 to 32.76 KRPM If, rather than the nominal speed, the rating plate indicates the synchronous speed and the slip in Hz or as a %, calculate the nominal speed as follows: Nominal speed = Synchronous speed x $\frac{100 - \text{slip as a \%}}{100}$ or Nominal speed = Synchronous speed x $\frac{50 - \text{slip in Hz}}{50}$ (50 Hz motors) or Nominal speed = Synchronous speed x $\frac{60 - \text{slip in Hz}}{60}$ (60 Hz motors)
9606	2042 / 7	**COS**	R/WS	**Motor Cos Phi given on the rating plate** Unit: 0.01 Factory setting: According to drive rating Adjustment range: 50 to 100
9643	2042 / 2C	**rSC**	R/WS	**Cold state stator resistance** Factory setting: 0 0 = "nO": Function inactive. For applications which do not require high performance or do not tolerate autotuning (passing a current through the motor) each time the drive is switched on. 1 = "InIt": Activates the function. To improve low-speed performance whatever the thermal state of the motor. >1 = "XXXX" XXXX: Value of cold state stator resistance used, in mΩ. Caution: It is strongly recommended that this function is activated for Lifting and Handling applications. The function should be activated (InIt) only when the motor is in cold state. When rSC = InIt, parameter tUn is forced to POn. At the next run command or the next power-up, the stator resistance is measured with an auto-tune. Parameter rSC then changes to this value (XXXX) and maintains it; tUn remains forced to POn. Parameter rSC remains at InIt as long as the measurement has not been performed. Value XXXX can be forced or changed using the ▲ ▼ keys (1).

(1) Procedure:
- Check that the motor is cold.
- Disconnect the cables from the motor terminals.
- Measure the resistance between 2 of the motor terminals (U. V. W) without modifying its connection.
- Use the ▲ ▼ keys to enter half the measured value.
- Increase the factory setting of UFr (page 24) to 100% rather than 20%.

⚠ Do not use rSC on any other setting than nO or tUn = POn with the flying restart function (FLr page 48).

Modbus address	CANopen address	Code	Read/ Write	Name/Description/Possible values
9608	2042 / 9	**tUn**	R/WO	**Motor control auto-tuning** Factory setting: 0 It is essential that all the motor parameters (UnS, FrS, nCr, nSP, COS) are correctly configured before performing the auto-tuning. 0 = "nO": Auto-tuning not performed. 112 = "YES": Auto-tuning is performed as soon as possible, then the parameter automatically switches to dOnE or nO in the event of a fault (the tnF fault is displayed if tnL = YES, see page 50). 113 = "dOnE": Use of the values given the last time auto-tuning was performed. 114 = "rUn": Auto-tuning is performed every time a run command is sent. 115 = "POn": Auto-tuning is performed on every power-up. 129 = "LI1": Logic input LI1 130 = "LI2": Logic input LI2 131 = "LI3": Logic input LI3 132 = "LI4": Logic input LI4 133 = "LI5": Logic input LI5 134 = "LI6": Logic input LI6 LI1 to LI6: Auto-tuning is performed on the transition from 0 → 1 of a logic input assigned to this function. **Caution:** tUn is forced to POn if rSC = InIt. Auto-tuning is only performed if no command has been activated. If a "freewheel stop" or "fast stop" function has been assigned to a logic input, this input must be set to 1 (active at 0). Auto-tuning may last for 1 to 2 seconds. Do not interrupt; wait for the display to change to "dOnE" or "nO". ⚠ During auto-tuning the motor operates at nominal current.
9609	2042 / A	**tUS**	R	**Auto-tuning status** Factory setting: 0 0 =" tAb": The default stator resistance value is used to control the motor. 1 = "PEnd": Auto-tuning has been requested but not yet performed. 2 = "PrOG": Auto-tuning in progress. 3 = "FAIL": Auto-tuning has failed. 4 = "dOnE": The stator resistance measured by the auto-tuning function is used to control the motor. 5 = "Strd": The cold state stator resistance (rSC other than nO) is used to control the motor.
9607	2042 / 8	**UFt**	R/WS	**Selection of the type of voltage/frequency ratio** Factory setting: 2 0 = "L": Constant torque for motors connected in parallel or special motors 1 = "P": Variable torque for pump and fan applications 2 = "n": Sensorless flux vector control for constant torque applications 3 = "nLd": Energy saving, for variable torque applications not requiring high dynamics (behaves in a similar way to the P ratio at no load and the n ratio on load).
3107	2001 / 8	**nrd**	R/WS	**Random switching frequency** Factory setting: 1 0 = "nO": Fixed frequency 1 = "YES": Frequency with random modulation Random frequency modulation prevents any resonance which may occur at a fixed frequency.
3102	2001 / 3	**SFr**	R/W	**Switching frequency** Unit: 0.1 kHz Factory setting: 40 Adjustment range: 20 to 160 The frequency can be adjusted to reduce the noise generated by the motor. If the frequency has been set to a value higher than 4 kHz, in the event of excessive temperature rise, the drive will automatically reduce the switching frequency and increase it again once the temperature has returned to normal.
3103	2001 / 4	**tFr**	R/WS	**Maximum output frequency** Unit: 0.1 Hz Factory setting: if BFR = 50: 600 if BFR = 60: 720 Adjustment range: 100 to 5000

Modbus address	CANopen address	Code	Read/ Write	Name/Description/Possible values
9101	203D / 2	**SrF**	R/WS	**Suppression of the speed loop filter** Factory setting: 0 0 = "nO": The speed loop filter is active (prevents the reference being exceeded). 1 = "YES": The speed loop filter is suppressed (in position control applications, this reduces the response time and the reference may be exceeded).
8001	2032 / 2	**SCS**	R/WS	**Saving the configuration** Factory setting: 0 0 = "nO": Function inactive 2 = "Str1": Saves the current configuration (but not the result of auto-tuning) to EEPROM. SCS automatically switches to nO as soon as the save has been performed. This function is used to keep another configuration in reserve, in addition to the current configuration. When drives leave the factory the current configuration and the backup configuration are both initialized with the factory configuration. If the remote display terminal option is connected to the drive, the following additional selection options will appear: 11 = "FIL1" 12 = "FIL2" 13 = "FIL3" 14 = "FIL4" FIL1, FIL2, FIL3, FIL4 are files available in the remote display terminal's EEPROM memory for saving the current configuration. They can be used to store between 1 and 4 different configurations which can also be stored on or even transferred to other drives of the same rating. SCS automatically switches to nO as soon as the save has been performed.
3052	2000 / 35	**CFG**	R/WS	**Source configuration** Factory setting: 1 Choice of source configuration. 0 = "StS": Run/stop configuration. Identical to the factory configuration apart from the I/O assignments: • Logic inputs: - LI1, LI2 (2 directions of operation): 2-wire transition detection control, LI1 = forward, LI2 = reverse, inactive on ATV 31●●●●●●A drives (not assigned) - LI3 to LI6: Inactive (not assigned) • Analog inputs: - AI1: Speed reference 0-10 V, inactive on ATV 31●●●●●●A (not assigned) - AI2, AI3: Inactive (not assigned) • Relay R1: The contact opens in the event of a fault (or drive off) • Relay R2: Inactive (not assigned) • Analog output AOC: 0-20 mA inactive (not assigned) 1 = "Std": Factory configuration ⚠ The assignment of CFG results directly in a return to the selected configuration.
8002	2032 / 3	**FCS**	R/WS	**Return to factory settings/Restore configuration** Factory setting: 0 0 = "nO": Function inactive 2 = "rEC1": The current configuration becomes identical to the backup configuration previously saved by SCS = StrI. rECI is only visible if the backup has been carried out. FCS automatically changes to nO as soon as this action has been performed. 64 = "InI": The current configuration is replaced by the configuration selected by parameter CFG (1). FCS automatically changes to nO as soon as this action has been performed. If the remote display terminal option is connected to the drive, the following additional selection options appear, as long as the corresponding files have been loaded in the remote display terminal's EEPROM memory (0 to 4 files): 11 = "FIL1": display terminal file 1 not empty 12 = "FIL2": display terminal file 2 not empty 13 = "FIL3": display terminal file 3 not empty 14 = "FIL4": display terminal file 4 not empty They enable the current configuration to be replaced with one of the 4 configurations that may be loaded on the remote display terminal. FCS automatically changes to nO as soon as this action has been performed.

(1) The following configuration and adjustment parameters do not revert to their factory settings; they retain their current configuration:
- bFr (Standard motor frequency) page 26
- LCC (Control via remote display terminal) page 34
- COd (Terminal locking code) page 52
- Communication parameters, page 51

Modbus address	CANopen address	Code	Read/ Write	Name/Description/Possible values
11101	2051 / 2	**tCC**	R/WS	**2-wire/3-wire control** (Type of control) Factory setting: 0 except for ATV31●●●A: 2 Control configuration: 0 = "2C" = 2-wire control: The open or closed state of the input controls running or stopping. 1 = "3C" = 3-wire control (pulse control): A "forward" or "reverse" pulse is sufficient to control starting, a "stop" pulse is sufficient to control stopping. 2 = "LOC "= local control (drive RUN/STOP/RESET) for ATV31●●●A only (inactive if LAC = L3, see page 32). ⚠ Changing the assignment of tCC returns the following functions to their factory setting: rrS, tCt and all functions affecting logic inputs.
11102	2051 / 3	**tCt**	R/WS	**Type of 2-wire control** (parameter active only if tCC = 2C) Factory setting: 1 0 = "LEL ": State 0 or 1 is taken into account for run or stop. 1 = "trn": A change of state (transition or edge) is necessary to initiate operation, in order to prevent accidental restarts after a break in the power supply. 2 = "PFO": State 0 or 1 is taken into account for run or stop, but the "forward" input always takes priority over the "reverse" input.
11105	2051 / 6	**rrS**	R/WS	**Reverse operation via logic input** Factory setting: - if tCC = 0: 130 - if tCC = 1: 131 - if tCC = 2: 0 If rrS = nO, reverse operation is active, by means of negative voltage on AI2 for example. 0 = "nO": Not assigned 129 = "LI1": Logic input LI1 130 = "LI2": Logic input LI2 131 = "LI3": Logic input LI3 132 = "LI4": Logic input LI4 133 = "LI5": Logic input LI5 134 = "LI6": Logic input LI6
4434	200E / 23	**CrL3**	R/WS	**Value for low speed (LSP) on input AI3** Unit: 0.1 mA Factory setting: 40 Adjustment range: 0 to 200 CrL3 and CrH3 are used to configure the input for 0-20 mA, 4-20 mA, 20-4 mA, etc.
4444	200E / 2D	**CrH3**	R/WS	**Value for high speed (HSP) on input AI3** Unit: 0.1 mA Factory setting: 200 Adjustment range: 40 to 200 CrL3 and CrH3 are used to configure the input for 0-20 mA, 4-20 mA, 20-4 mA, etc.
4601	2010 / 2	**AO1t**	R/WS	**Configuration of the analog output** Factory setting: 2 1 = "10U": 0 - 10 V configuration (use terminal AOV) 2 = "0A": 0 - 20 mA configuration (use terminal AOC) 3 = "4A": 4 - 20 mA configuration (use terminal AOC)

Modbus address	CANopen address	Code	Read/ Write	Name/Description/Possible values
5031	2014 / 20	**dO**	R/WS	**Analog/logic output AOC/AOV** Factory setting: 0 0 = "nO": Not assigned For the following assignments the output is analog type: 129 = "OCr": Motor current. 20 mA or 10 V corresponds to twice the nominal drive current. 130 = "OFr": Motor frequency. 20 mA or 10 V corresponds to the maximum frequency tFr (page 28). 132 = "Otr": Motor torque. 20 mA or 10 V corresponds to twice the nominal motor torque. 139 = "OPr": Power supplied by the drive. 20 mA or 10 V corresponds to twice the nominal drive power. For the following assignments the output is logic type (see diagram in the Installation Manual): ⚠ With these assignments, configure AO1t = 0A. 1 = "FLt": Drive fault 2 = "rUn": Drive running 4 = "FtA": Frequency threshold reached (Ftd parameter page 25) 5 = "FLA": High speed (HSP) reached 6 = "CtA": Current threshold reached (Ctd parameter page 25) 7 = "SrA": Frequency reference reached 8 = "tSA": Motor thermal threshold reached (ttd parameter page 25) 9 = "bLC": Brake sequence (for information, as this assignment can be only be activated or deactivated via the bLC parameter page 44) 12 = "APL": Loss of 4-20 mA signal, even if LFL = nO (page 50) The logic output is in state 1 (24 V) when the selected assignment is active, with the exception of FLt (state 1 if the drive is not faulty).
5001	2014 / 2	**r1**	R/WS	**Relay r1** Factory setting: 1 0 = "nO": Not assigned 1 = "FLt": Drive fault 2 = "rUn": Drive running 4= "FtA": Frequency threshold reached (Ftd parameter page 25) 5 = "FLA": High speed (HSP) reached 6 = "CtA": Current threshold reached (Ctd parameter page 25) 7 = "SrA": Frequency reference reached 8 = "tSA": Motor thermal threshold reached (ttd parameter page 25) 12 = "APL": Loss of 4-20 mA signal, even if LFL = nO (page 50) 129 = "LI1": Returns the value of LI1. 130 = "LI2": Returns the value of LI2. 131 = "LI3": Returns the value of LI3. 132 = "LI4": Returns the value of LI4. 133 = "LI5": Returns the value of LI5. 134 = "LI6": Returns the value of LI6. The relay is powered up when the selected assignment is active, with the exception of FLt (powered up if the drive is not faulty).
5002	2014 / 3	**r2**	R/WS	**Relay r2** Factory setting: 0 0 = "nO": Not assigned 1 = "FLt": Drive fault 2 = "rUn": Drive running 4 = "FtA": Frequency threshold reached (Ftd parameter page 25) 5 = "FLA": High speed (HSP) reached 6 = "CtA": Current threshold reached (Ctd parameter page 25) 7 = "SrA": Frequency reference reached 8 = "tSA": Motor thermal threshold reached (ttd parameter page 25) 9 = "bLC": Brake sequence (for information, as this assignment can be only be activated or deactivated via the bLC parameter page 44) 12 = "APL": Loss of 4-20 mA signal, even if LFL = nO (page 50) 129 = "LI1": Returns the value of LI1. 130 = "LI2": Returns the value of LI2. 131 = "LI3": Returns the value of LI3. 132 = "LI4": Returns the value of LI4. 133 = "LI5": Returns the value of LI5. 134 = "LI6": Returns the value of LI6. The relay is powered up when the selected assignment is active, with the exception of FLt (powered up if the drive is not faulty).

Modbus address	CANopen address	Code	Read/ Write	Name/Description/Possible values
3006	2000 / 7	**LAC**	R/WS	**Function access level** Factory setting: 0 0 = "L1": Access to standard functions. Significantly, this level is interchangeable with ATV28. 1 = "L2": Access to advanced functions: - +/- speed (motorized potentiometer) - Brake control - Switching for second current limit - Motor switching - Management of limit switches 2 = L3: Access to advanced functions and management of mixed control modes. ⚠ Assigning LAC to L3 will restore the factory settings of the Fr1 (below), Cd1 (page 33), CHCF (page 33), and tCC (page 30) parameters. The latter is forced to "2C" on ATV31●●●A. L3 can only be restored to L2 or L1 and L2 to L1 by means of a "factory setting" via FCS (page 29) or by setting bit 0 of CMI to 1 (page 16).
8413	2036 / E	**Fr1**	R/WS	**Configuration reference 1** Factory setting: 1 except for ATV31●●●●A: 16 1 = "AI1": Analog input AI1 2 = "AI2": Analog input AI2 3 = "AI3": Analog input AI3 16 = "AIP": Potentiometer (ATV31●●●A only) If LAC = L2 or L3, the following additional assignments are possible: 160 = "UPdt": (1) + speed/- speed via LI. See configuration page 42. 161 = "UpdH": (1) + speed/- speed via keys ▲▼ on the ATV31 or ATV31●●●A keypad or remote display terminal. For operation, display the frequency rFr (see page 17.) The +/- speed function via the keypad or display terminal is controlled from the SUP- menu by setting to parameter rFr. If LAC = L3, the following additional assignments are possible: 163 = "LCC": Reference via the remote display terminal, LFr parameter in the SEt- or SUP- menu. 164 = "Mdb": Reference via Modbus 167 = "CAn": Reference via CANopen
8414	2036 / F	**Fr2**	R/WS	**Configuration reference 2** Factory setting: 0 0 = "nO": Not assigned 1 = "AI1": Analog input AI1 2 = "AI2": Analog input AI2 3 = "AI3": Analog input AI3 16 = "AIP": Potentiometer (ATV31●●●A only) If LAC = L2 or L3, the following additional assignments are possible: 160 = "UPdt": (1) + speed/- speed via LI. See configuration page 42. 161 = "UpdH": (1) + speed/- speed via keys ▲▼ on the ATV31 or ATV31●●●A keypad or remote display terminal. For operation, display the frequency rFr (see page 17). The +/- speed function via the keypad or display terminal is controlled from the SUP- menu by setting to parameter rFr. If LAC = L3, the following additional assignments are possible: 163 = "LCC": Reference via the remote display terminal, LFr parameter in the SEt- or SUP- menu. 164 = "Mdb": Reference via Modbus 167 = "CAn": Reference via CANopen

(1) CAUTION:
- You cannot assign UPdt to Fr1 or Fr2 and UPdH to Fr1 or Fr2 at the same time. Only one of the UPdt/UPdH assignments is permitted on each reference channel.
- The +/- speed function in Fr1 is incompatible with several functions (see page 10). Before configuring it, these functions must be unassigned, especially the summing inputs (set SA2 to nO page 38) and the preset speeds (set PS2 and PS4 to nO page 39) which are assigned in the factory settings.
- In Fr2, the +/- speed function is compatible with the preset speeds, summing inputs and the PI regulator.

Modbus address	CANopen address	Code	Read/ Write	Name/Description/Possible values
8411	2036 / C	**rFC**	R/WS	**Reference switching** Factory setting: 96 Parameter rFC can be used to select channel Fr1 or Fr2 or to configure a logic input or a control bit for remote switching of Fr1 or Fr2. 96 = "Fr1": Reference = Reference 1 97 = "Fr2": Reference = Reference 2 129 = "LI1": Logic input LI1 130 = "LI2": Logic input LI2 131 = "LI3": Logic input LI3 132 = "LI4": Logic input LI4 133 = "LI5": Logic input LI5 134 = "LI6": Logic input LI6 If LAC = L3, the following additional assignments are possible: 187 = "C111": bit 11 of the CMD control word (page 15) written by Modbus 188 = "C112": bit 12 of the CMD control word (page 15) written by Modbus 189 = "C113": bit 13 of the CMD control word (page 15) written by Modbus 190 = "C114": bit 14 of the CMD control word (page 15) written by Modbus 191 = "C115": bit 15 of the CMD control word (page 15) written by Modbus 203 = "C211": bit 11 of the CMD control word (page 15) written by CANopen 205 = "C213": bit 13 of the CMD control word (page 15) written by CANopen 206 = "C214": bit 14 of the CMD control word (page 15) written by CANopen 207 = "C215": bit 15 of the CMD control word (page 15) written by CANopen The reference can be switched with the drive running. Fr1 is active when the logic input or control word bit is at state 0. Fr2 is active when the logic input or control word bit is at state 1. ⚠ Switching channel may result in a change of direction of motor rotation.
8401	2036 / 2	**CHCF**	R/WS	**Mixed mode** (control channels separated from reference channels) Factory setting: 1 Active if LAC = L3 1 = "SIM": Combined 2 = "SEP": Separate
8423	2036 / 18	**Cd1**	R/WS	**Configuration of control channel 1** Factory setting: 1 except for ATV31●●●A: 2 Active if CHCF = SEP and LAC = L3 1 = "tEr": Terminal block control 2 = "LOC": Keypad control (ATV31●●●A only) 3 = "LCC": Remote display terminal control 10 = "Mdb": Control via Modbus 20 = "CAn": Control via CAN
8424	2036 / 19	**Cd2**	R/WS	**Configuration of control channel 2** Factory setting: 10 Active if CHCF = SEP and LAC = L3 1 = "tEr": Terminal block control 2 = "LOC": Keypad control (ATV31●●●A only) 3 = "LCC": Remote display terminal control 10 = "Mdb": Control via Modbus 20 = "CAn": Control via CAN

Modbus address	CANopen address	Code	Read/ Write	Name/Description/Possible values
8421	2036 / 16	**CCS**	R/WS	**Control channel switching** Factory setting: 98 Active if CHCF = SEP and LAC = L3 Parameter CCS can be used to select channel Cd1 or Cd2 or to configure a logic input or a control bit for remote switching of Cd1 or Cd2. 98 = "Cd1": Control channel = Channel 1 99 = "Cd2": Control channel = Channel 2 129 = "LI1": Logic input LI1 130 = "LI2": Logic input LI2 131 = "LI3": Logic input LI3 132 = "LI4": Logic input LI4 133 = "LI5": Logic input LI5 134 = "LI6": Logic input LI6 187 = "C111": bit 11 of the CMD control word (page 15) written by Modbus 188 = "C112": bit 12 of the CMD control word (page 15) written by Modbus 189 = "C113": bit 13 of the CMD control word (page 15) written by Modbus 190 = "C114": bit 14 of the CMD control word (page 15) written by Modbus 191 = "C115": bit 15 of the CMD control word (page 15) written by Modbus 203 = "C211": bit 11 of the CMD control word (page 15) written by CANopen 204 = "C212": bit 12 of the CMD control word (page 15) written by CANopen 205 = "C213": bit 13 of the CMD control word (page 15) written by CANopen 206 = "C214": bit 14 of the CMD control word (page 15) written by CANopen 207 = "C215": bit 15 of the CMD control word (page 15) written by CANopen Channel 1 is active when the input or control word bit is at state 0. Channel 2 is active when the input or control word bit is at state 1. ⚠ Switching channel may result in a change of direction of motor rotation.
8402	2036 / 3	**COP**	R/WS	**Copy channel 1 to channel 2** Factory setting: 0 Active if LAC = L3 Copying is only performed from channel 1 to channel 2. 0 = "nO": No copy 1 = "SP": Copy reference 2 = "Cd": Copy control 3 = "ALL": Copy control and reference Exceptions: • If channel 2 is controlled via the terminal block (2-wire or 3-wire control), channel 1 control is not copied. • If channel 2 reference is set via analog input (AI1, AI2, AI3 or AIP), channel 1 reference is not copied. Reference copied: • If channel 2 is the +/- speed type, the output frequency applied to the motor (rFr) is copied. • In other cases (built-in keypad, remote display terminal or communication bus), the reference before ramp (FrH) is copied. **Note:** If channel 2 is a communication bus, the copy is "overwritten" as soon as a new control or reference is received by the bus.
64003	2262 / 4	**LCC**	R/WS	**Control via remote display terminal** Factory setting: 0 Parameter active only with the remote display terminal option and if LAC = L1 or L2. 0 = "nO": Function inactive 1 = "YES": Enables control of the drive using the STOP/RESET, RUN and FWD/REV buttons on the display terminal. The speed reference is then given by parameter LFr page 15. Only the freewheel, fast stop and DC injection stop commands remain active on the terminal block. If the drive/terminal connection is cut or if the terminal has not been connected, the drive locks in an SLF fault.
64002	2262 / 3	**PSt**	R/WS	**Stop priority** Factory setting: 1 This function gives priority to the STOP key on the keypad (ATV31●●●A only) or the STOP key on the remote display terminal, regardless of the control channel (terminal block or communication bus). 0 = "nO": Function inactive 1 = "YES": STOP key priority

Modbus address	CANopen address	Code	Read/ Write	Name/Description/Possible values
64001	2262 / 2	**rOt**	R/WS	**Direction of operation authorized** Factory setting: 0 Direction of operation authorized for the RUN key on the keypad (ATV31●●●A only) or the RUN key on the remote display terminal. 0 = "dFr": Forward 1 = "drS": Reverse 2 = "bOt": Both directions are authorized (except for the keypad on the ATV31●●●A: Forward only).
9004	203C / 5	**rPt**	R/WS	**Type of ramp** Defines the shape of the acceleration and deceleration ramps. Factory setting: 0 0 = "LIn": Linear 1 = "S": S ramp 2 = "U": U ramp 3 = "CUS": Customized
9005	203C / 6	**tA1**	R/W	**Start of CUS-type acceleration ramp rounded** Unit: 1% (as % of total ramp time ACC or AC2) Factory setting: 10 Adjustment range: 0 to 100
9006	203C / 7	**tA2**	R/W	**End of CUS-type acceleration ramp rounded** Unit: 1% (as % of total ramp time ACC or AC2) Factory setting: 10 Adjustment range: 0 to 100 - tA1
9007	203C / 8	**tA3**	R/W	**Start of CUS-type deceleration ramp rounded** Unit: 1% (as % of total ramp time dEC or dE2) Factory setting: 10 Adjustment range: 0 to 100
9008	203C / 9	**tA4**	R/W	**End of CUS-type deceleration ramp rounded** Unit: 1% (as % of total ramp time dEC or dE2) Factory setting: 10 Adjustment range: 0 to 100 - tA3
9020	203C / 15	**Inr**	R/WS	**Ramp increment** Factory setting: 1 0 = "0.01" : Ramp can be set between 0.05 s and 327.6 s 1 = "0.1" : Ramp can be set between 0.1 s and 3276 s 2 = "1" : Ramp can be set between 1 s and 32760 s This parameter applies to parameters ACC, DEC, AC2 and DE2 ⚠ Modifying parameter Inr results in modification of the settings of parameters ACC, DEC, AC2 and DE2.
9001	203C / 2	**ACC**	R/W	**Acceleration ramp time** Unit: 0.1 s Factory setting: 30 Adjustment range: According to parameter Inr Defined for accelerating between 0 and the nominal frequency FrS (page 26).
9002	203C / 3	**dEC**	R/W	**Deceleration ramp time** Unit: 0.1 s Factory setting: 30 Adjustment range: According to parameter Inr Defined for decelerating between the nominal frequency FrS (page 26) and 0. Check that the value of dEC is not too low in relation to the load to be stopped.

<table>
<tr><th>Modbus address</th><th>CANopen address</th><th>Code</th><th>Read/ Write</th><th>Name/Description/Possible values</th></tr>
<tr><td>9010</td><td>203C / B</td><td>rPS</td><td>R/WS</td><td>Ramp switching
Factory setting: 0
This function remains active regardless of the control channel.
0 = "nO": Not assigned
129 = "LI1": Logic input LI1
130 = "LI2": Logic input LI2
131 = "LI3": Logic input LI3
132 = "LI4": Logic input LI4
133 = "LI5": Logic input LI5
134 = "LI6": Logic input LI6

If LAC = L3, the following assignments are possible:

171 = "Cd11": bit 11 of the CMD control word (page 15) written by Modbus or CANopen
172 = "Cd12": bit 12 of the CMD control word (page 15) written by Modbus or CANopen
173 = "Cd13": bit 13 of the CMD control word (page 15) written by Modbus or CANopen
174 = "Cd14": bit 14 of the CMD control word (page 15) written by Modbus or CANopen
175 = "Cd15": bit 15 of the CMD control word (page 15) written by Modbus or CANopen

ACC and dEC are enabled when the logic input or control word bit is at state 0.
AC2 and dE2 are enabled when the logic input or control word bit is at state 1.</td></tr>
<tr><td>9011</td><td>203C / C</td><td>Frt</td><td>R/WS</td><td>Ramp switching threshold
Unit: 0.1 Hz
Factory setting: 0
Adjustment range: 0 to 5000
The second ramp is switched if the value of Frt is not equal to 0 (0 deactivates the function) and the output frequency is greater than Frt.
Threshold ramp switching can be combined with switching via LI or bit as follows:
<table>
<tr><th>LI or bit</th><th>Frequency</th><th>Ramp</th></tr>
<tr><td>0
0
1
1</td><td><Frt
>Frt
<Frt
>Frt</td><td>ACC, dEC
AC2, dE2
AC2, dE2
AC2, dE2</td></tr>
</table></td></tr>
<tr><td>9012</td><td>203C / D</td><td>AC2</td><td>R/W</td><td>2nd acceleration ramp time
Unit: 0.1 s
Factory setting: 50
Adjustment range: According to parameter Inr
Enabled via logic input (rPS) or frequency threshold (Frt).</td></tr>
<tr><td>9013</td><td>203C / E</td><td>dE2</td><td>R/W</td><td>2nd deceleration ramp time
Unit: 0.1 s
Factory setting: 50
Adjustment range: According to parameter Inr
Enabled via logic input (rPS) or frequency threshold (Frt).</td></tr>
<tr><td>9003</td><td>203C / 4</td><td>brA</td><td>R/WS</td><td>Deceleration ramp adaptation
Factory setting: 1
Activating this function automatically adapts the deceleration ramp, if this has been set at too low a value for the inertia of the load.
0 = "nO": Function inactive
1 = "YES": Function active. The function is incompatible with applications requiring:
- positioning on a ramp
- the use of a braking resistor (no guarantee of the function operating correctly)
brA is forced to nO if brake control bLC is assigned (page 44).</td></tr>
<tr><td>11201</td><td>2052 / 2</td><td>Stt</td><td>R/WS</td><td>Normal stop mode
Factory setting: 0
Stop mode on disappearance of the run command or appearance of a stop command.
0 = "rMP": On ramp
1 = "FSt": Fast stop
2 = "nSt": Freewheel stop
3 = "dCI": DC injection stop</td></tr>
</table>

Modbus address	CANopen address	Code	Read/ Write	Name/Description/Possible values
11204	2052 / 5	**FSt**	R/WS	**Fast stop via logic input** Factory setting: 0 0 = "nO": Not assigned 129 = "LI1": Logic input LI1 130 = "LI2": Logic input LI2 131 = "LI3": Logic input LI3 132 = "LI4": Logic input LI4 133 = "LI5": Logic input LI5 134 = "LI6": Logic input LI6 If LAC = L3, the following assignments are possible: 171 = "Cd11": bit 11 of the CMD control word (page 15) written by Modbus or CANopen 172 = "Cd12": bit 12 of the CMD control word (page 15) written by Modbus or CANopen 173 = "Cd13": bit 13 of the CMD control word (page 15) written by Modbus or CANopen 174 = "Cd14": bit 14 of the CMD control word (page 15) written by Modbus or CANopen 175 = "Cd15": bit 15 of the CMD control word (page 15) written by Modbus or CANopen The stop is activated when the logic state of the input changes to 0 and the control word bit changes to 1. The fast stop is a stop on a reduced ramp via parameter dCF. If the input falls back to state 1 and the run command is still active, the motor will only restart if 2-wire level control has been configured (tCC = 2C and tCt = LEL or PFO, see page 30). In other cases, a new run command must be sent.
11230	2052 / 1F	**dCF**	R/WS	**Coefficient for dividing the deceleration ramp time for fast stopping** Unit: 1 Factory setting: 4 Adjustment range: 0 to 10 Parameter accessible if a fast stop has been assigned by one of the following parameters: Stt/FSt (page 36) or EPL/OHL/OLL/SLL/COL (page 49) or LFL/StP (page 50). Ensure that the reduced ramp is not too low in relation to the load to be stopped. The value 0 corresponds to the minimum ramp.
11203	2052 / 4	**dCI**	R/WS	**DC injection via logic input** **Caution** This function is incompatible with the "Brake control" function (see page 10). Factory setting: 0 0 = "nO": Not assigned 129 = "LI1": Logic input LI1 130 = "LI2": Logic input LI2 131 = "LI3": Logic input LI3 132 = "LI4": Logic input LI4 133 = "LI5": Logic input LI5 134 = "LI6": Logic input LI6 If LAC = L3, the following assignments are possible: 171 = "Cd11": bit 11 of the CMD control word (page 15) written by Modbus or CANopen 172 = "Cd12": bit 12 of the CMD control word (page 15) written by Modbus or CANopen 173 = "Cd13": bit 13 of the CMD control word (page 15) written by Modbus or CANopen 174 = "Cd14": bit 14 of the CMD control word (page 15) written by Modbus or CANopen 175 = "Cd15": bit 15 of the CMD control word (page 15) written by Modbus or CANopen Braking is activated when the logic state of the input or control word bit is at 1.
11210	2052 / B	**IdC**	R/W	**Level of DC injection braking current activated via logic input or selected as stop mode** **Caution**: This setting is not related to the "automatic standstill DC injection" function. Unit: 0.1 A Factory setting: 0.7 In (1) Adjustment range: 0 to In (1) After 5 seconds the injection current is peak limited at 0.5 Ith if it is set at a higher value. (1) In corresponds to the nominal drive current indicated in the Installation Manual and on the drive rating plate.
11211	2052 / C	**tdC**	R/W	**Total DC injection braking time selected as normal stop mode** **Caution**: This setting is not related to the "automatic standstill DC injection" function. Unit: 0.1 s Factory setting: 5 Adjustment range: 1 to 300

Modbus address	CANopen address	Code	Read/ Write	Name/Description/Possible values
11202	2052 / 3	**nSt**	R/WS	**Freewheel stop via logic input** Factory setting: 0 0 = "nO": Not assigned 129 = "LI1": Logic input LI1 130 = "LI2": Logic input LI2 131 = "LI3": Logic input LI3 132 = "LI4": Logic input LI4 133 = "LI5": Logic input LI5 134 = "LI6": Logic input LI6 The stop is activated when the logic state of the input is at 0. If the input falls back to state 1 and the run command is still active, the motor will only restart if 2-wire level control has been configured. In other cases, a new run command must be sent.
10401	204A / 2	**AdC**	R/W	**Automatic standstill DC injection** (at the end of the ramp) Factory setting: 1 0 = "nO": No injection 1 = "YES": Standstill injection for adjustable period 2 = "Ct": Continuous standstill injection ⚠ This parameter gives rise to the injection of current even if a run command has not been sent.
10402	204A / 3	**tdC1**	R/W	**Automatic standstill DC injection time** Unit: 0.1 s Factory setting: 50 Adjustment range: 1 to 300
10403	204A / 4	**SdC1**	R/W	**Level of automatic standstill DC injection current** Unit: 0.1 A Factory setting: 0.7 In (1) Adjustment range: 0 to 1.2 In (1) ⚠ Check that the motor will withstand this current without overheating.
10404	204A / 5	**tdC2**	R/W	**2nd automatic standstill DC injection time** Unit: 0.1 s Factory setting: 0 Adjustment range: 0 to 300
10405	204A / 6	**SdC2**	R/W	**2nd level of standstill DC injection current** Unit: 0.1 A Factory setting: 0.5 In (1) Adjustment range: 0 to 1.2 In (1) ⚠ Check that the motor will withstand this current without overheating.
11801	2058 / 2	**SA2**	R/WS	**Summing input 2** **Caution** The "Summing inputs" function may be incompatible with other functions (see page 10). Factory setting: 2 Can be used to sum one or two inputs to reference Fr1 only. 0 = "nO": Not assigned 1 = "AI1": Analog input AI1 2 = "AI2": Analog input AI2 3 = "AI3": Analog input AI3 16 = "AIP": Potentiometer (type A drives only) If LAC = L3, the following assignments are possible: 163 = "LCC": Reference via the remote display terminal, LFr parameter in the SEt- or SUP- menu. 164 = "Mdb": Reference via Modbus 167 = "CAn": Reference via CANopen

(1) In corresponds to the nominal drive current indicated in the Installation Manual and on the drive rating plate.

Modbus address	CANopen address	Code	Read/ Write	Name/Description/Possible values
11802	2058 / 3	**SA3**	R/WS	**Summing input 3** **Caution** The "Summing inputs" function may be incompatible with other functions (see page 10). Factory setting: 0 Can be used to sum one or two inputs to reference Fr1 only. 0 = "nO": Not assigned 1 = "AI1": Analog input AI1 2 = "AI2": Analog input AI2 3 = "AI3": Analog input AI3 16 = "AIP": Potentiometer (type A drives only) If LAC = L3, the following assignments are possible: 163 = Reference via the remote display terminal, LFr parameter in the SEt- or SUP- menu. 164 = "Mdb": Reference via Modbus 167 = "CAn": Reference via CANopen
11401	2054 / 2	**PS2**	R/WS	**2 preset speeds** Factory setting: if tCC = 1: 0 if tCC = 0 or 2: 131 Selecting the assigned logic input activates the function (1). 0 = "nO": Not assigned 129 = "LI1": Logic input LI1 130 = "LI2": Logic input LI2 131 = "LI3": Logic input LI3 132 = "LI4": Logic input LI4 133 = "LI5": Logic input LI5 134 = "LI6": Logic input LI6 If LAC = L3, the following assignments are possible: 171 = "Cd11": bit 11 of the CMD control word (page 15) written by Modbus or CANopen 172 = "Cd12": bit 12 of the CMD control word (page 15) written by Modbus or CANopen 173 = "Cd13": bit 13 of the CMD control word (page 15) written by Modbus or CANopen 174 = "Cd14": bit 14 of the CMD control word (page 15) written by Modbus or CANopen 175 = "Cd15": bit 15 of the CMD control word (page 15) written by Modbus or CANopen
11402	2054 / 3	**PS4**	R/WS	**4 preset speeds** Factory setting: if tCC = 1: 0 if tCC = 0 or 2: 132 Selecting the assigned logic input activates the function (1). Check that PS2 has been assigned before assigning PS4. 0 = "nO": Not assigned 129 = "LI1": Logic input LI1 130 = "LI2": Logic input LI2 131 = "LI3": Logic input LI3 132 = "LI4": Logic input LI4 133 = "LI5": Logic input LI5 134 = "LI6": Logic input LI6 If LAC = L3, the following assignments are possible: 171 = "Cd11": bit 11 of the CMD control word (page 15) written by Modbus or CANopen 172 = "Cd12": bit 12 of the CMD control word (page 15) written by Modbus or CANopen 173 = "Cd13": bit 13 of the CMD control word (page 15) written by Modbus or CANopen 174 = "Cd14": bit 14 of the CMD control word (page 15) written by Modbus or CANopen 175 = "Cd15": bit 15 of the CMD control word (page 15) written by Modbus or CANopen

(1) **Caution** The "Preset speeds" function may be incompatible with other functions (see page 10).

Modbus address	CANopen address	Code	Read/ Write	Name/Description/Possible values
11403	2054 / 4	**PS8**	R/WS	**8 preset speeds** Factory setting: 0 Selecting the assigned logic input activates the function (1). Check that PS4 has been assigned before assigning PS8. 0 = "nO": Not assigned 129 = "LI1": Logic input LI1 130 = "LI2": Logic input LI2 131 = "LI3": Logic input LI3 132 = "LI4": Logic input LI4 133 = "LI5": Logic input LI5 134 = "LI6": Logic input LI6 If LAC = L3, the following assignments are possible: 171 = "Cd11": bit 11 of the CMD control word (page 15) written by Modbus or CANopen 172 = "Cd12": bit 12 of the CMD control word (page 15) written by Modbus or CANopen 173 = "Cd13": bit 13 of the CMD control word (page 15) written by Modbus or CANopen 174 = "Cd14": bit 14 of the CMD control word (page 15) written by Modbus or CANopen 175 = "Cd15": bit 15 of the CMD control word (page 15) written by Modbus or CANopen
11404	2054 / 5	**PS16**	R/WS	**16 preset speeds** Factory setting: 0 Selecting the assigned logic input activates the function (1). Check that PS8 has been assigned before assigning PS16. 0 = "nO": Not assigned 129 = "LI1": Logic input LI1 130 = "LI2": Logic input LI2 131 = "LI3": Logic input LI3 132 = "LI4": Logic input LI4 133 = "LI5": Logic input LI5 134 = "LI6": Logic input LI6 If LAC = L3, the following assignments are possible: 171 = "Cd11": bit 11 of the CMD control word (page 15) written by Modbus or CANopen 172 = "Cd12": bit 12 of the CMD control word (page 15) written by Modbus or CANopen 173 = "Cd13": bit 13 of the CMD control word (page 15) written by Modbus or CANopen 174 = "Cd14": bit 14 of the CMD control word (page 15) written by Modbus or CANopen 175 = "Cd15": bit 15 of the CMD control word (page 15) written by Modbus or CANopen
11410	2054 / B	**SP2**	R/W	**2nd preset speed** Unit: 0.1 Hz Factory setting: 100 Adjustment range: 0 to 5000 (2)
11411	2054 / C	**SP3**	R/W	**3rd preset speed** Unit: 0.1 Hz Factory setting: 150 Adjustment range: 0 to 5000 (2)
11412	2054 / D	**SP4**	R/W	**4th preset speed** Unit: 0.1 Hz Factory setting: 200 Adjustment range: 0 to 5000 (2)
11413	2054 / E	**SP5**	R/W	**5th preset speed** Unit: 0.1 Hz Factory setting: 250 Adjustment range: 0 to 5000 (2)
11414	2054 / F	**SP6**	R/W	**6th preset speed** Unit: 0.1 Hz Factory setting: 300 Adjustment range: 0 to 5000 (2)
11415	2054 / 10	**SP7**	R/W	**7th preset speed** Unit: 0.1 Hz Factory setting: 350 Adjustment range: 0 to 5000 (2)

(1) **Caution** The "Preset speeds" function may be incompatible with other functions (see page 10).
(2) **Note:** The speed is always limited by parameter HSP (page 24).

Modbus address	CANopen address	Code	Read/ Write	Name/Description/Possible values
11416	2054 / 11	**SP8**	R/W	**8th preset speed** Unit: 0.1 Hz Factory setting: 400 Adjustment range: 0 to 5000 (1)
11417	2054 / 12	**SP9**	R/W	**9th preset speed** Unit: 0.1 Hz Factory setting: 450 Adjustment range: 0 to 5000 (1)
11418	2054 / 13	**SP10**	R/W	**10th preset speed** Unit: 0.1 Hz Factory setting: 500 Adjustment range: 0 to 5000 (1)
11419	2054 / 14	**SP11**	R/W	**11th preset speed** Unit: 0.1 Hz Factory setting: 550 Adjustment range: 0 to 5000 (1)
11420	2054 / 15	**SP12**	R/W	**12th preset speed** Unit: 0.1 Hz Factory setting: 600 Adjustment range: 0 to 5000 (1)
11421	2054 / 16	**SP13**	R/W	**13th preset speed** Unit: 0.1 Hz Factory setting: 700 Adjustment range: 0 to 5000 (1)
11422	2054 / 17	**SP14**	R/W	**14th preset speed** Unit: 0.1 Hz Factory setting: 800 Adjustment range: 0 to 5000 (1)
11423	2054 / 18	**SP15**	R/W	**15th preset speed** Unit: 0.1 Hz Factory setting: 900 Adjustment range: 0 to 5000 (1)
11424	2054 / 19	**SP16**	R/W	**16th preset speed** Unit: 0.1 Hz Factory setting: 1000 Adjustment range: 0 to 5000 (1)
11110	2051 / B	**JOG**	R/WS	**Jog operation** Factory setting: if tCC = 0 or 2: 0 if tCC = 1: 132 Selecting the assigned logic input activates the function. 0 = "nO": Not assigned 129 = "LI1": Logic input LI1 130 = "LI2": Logic input LI2 131 = "LI3": Logic input LI3 132 = "LI4": Logic input LI4 133 = "LI5": Logic input LI5 134 = "LI6": Logic input LI6 **Caution,** the "JOG operation" function may be incompatible with other (see page 10).
11111	2051 / C	**JGF**	R/W	**Jog operation reference** Unit: 0.1 Hz Factory setting: 100 Adjustment range: 0 to 100

(1) **Note:** The speed is always limited by parameter HSP (page 24).

Modbus address	CANopen address	Code	Read/ Write	Name/Description/Possible values
11501	2055 / 2	**USP**	R/WS	**+ speed (motorized potentiometer)** Factory setting: 0 Function active only if LAC = L2 or L3 and UPdt has been selected (see page 32). Selecting the assigned logic input activates the function (1). 0 = "nO": Not assigned 129 = "LI1": Logic input LI1 130 = "LI2": Logic input LI2 131 = "LI3": Logic input LI3 132 = "LI4": Logic input LI4 133 = "LI5": Logic input LI5 134 = "LI6": Logic input LI6
11502	2055 / 3	**dSP**	R/WS	**-speed (motorized potentiometer)** Factory setting: 0 Function active only if LAC = L2 or L3 and UPdt has been selected (see page 32). Selecting the assigned logic input activates the function (1). 0 = "nO": Not assigned 129 = "LI1": Logic input LI1 130 = "LI2": Logic input LI2 131 = "LI3": Logic input LI3 132 = "LI4": Logic input LI4 133 = "LI5": Logic input LI5 134 = "LI6": Logic input LI6
11503	2055 / 4	**Str**	R/WS	**Save reference** Factory setting: 0 Associated with the "+/- speed" function, this parameter can be used to save the reference: - When the run commands disappear (saved to RAM) - When the line supply or the run commands disappear (saved to EEPROM) On the next start-up, the speed reference is the last reference saved. 0 = "nO": No save 1 = "rAM": Save to RAM 2 = "EEP": Save to EEPROM
11901	2059 / 2	**PIF**	R/WS	**PI regulator feedback** Factory setting: 0 0 = "nO": Not assigned 1 = "AI1": Analog input AI1 2 = "AI2": Analog input AI2 3 = "AI3": Analog input AI3 **Caution** The "PI Regulator" function is incompatible with several functions (see page 10). Before configuring it, these functions must be unassigned, especially the summing inputs (set SA2 to nO page 38) and the preset speeds (set PS2 and PS4 to nO page 39) which are assigned in the factory settings.
11941	2059 / 2A	**rPG**	R/W	**PI regulator proportional gain** Unit: 0.01 Factory setting: 100 Adjustment range: 1 to 10000 Contributes to dynamic performance during rapid changes in the PI feedback.
11942	2059 / 2B	**rIG**	R/W	**PI regulator integral gain** Unit: 0.01 Factory setting: 100 Adjustment range: 1 to 10000 Contributes to static precision during slow changes in the PI feedback.
11903	2059 / 4	**FbS**	R/W	**PI feedback multiplication coefficient** Unit: 0.1 Factory setting: 10 Adjustment range: 1 to 1000 For process adaptation
11940	2059 / 29	**PIC**	R/W	**IReversal of the direction of correction of the PI regulator** Factory setting: 0 0 = "nO": normal 1 = "YES": reverse

(1) Caution The "+/- speed" function is incompatible with several functions (see page 10). Before configuring it, these functions must be unassigned, especially the summing inputs (set SA2 to nO page 38) and the preset speeds (set PS2 and PS4 to nO page 39) which are assigned in the factory settings.

Modbus address	CANopen address	Code	Read/ Write	Name/Description/Possible values
11909	2059 / A	**Pr2**	R/WS	**2 preset PI references** Factory setting: 0 Selecting the assigned logic input activates the function. 0 = "nO": Not assigned 129 = "LI1": Logic input LI1 130 = "LI2": Logic input LI2 131 = "LI3": Logic input LI3 132 = "LI4": Logic input LI4 133 = "LI5": Logic input LI5 134 = "LI6": Logic input LI6 If LAC = L3, the following assignments are possible: 171 = "Cd11": bit 11 of the CMD control word (page 15) written by Modbus or CANopen 172 = "Cd12": bit 12 of the CMD control word (page 15) written by Modbus or CANopen 173 = "Cd13": bit 13 of the CMD control word (page 15) written by Modbus or CANopen 174 = "Cd14": bit 14 of the CMD control word (page 15) written by Modbus or CANopen 175 = "Cd15": bit 15 of the CMD control word (page 15) written by Modbus or CANopen
11910	2059 / B	**Pr4**	R/WS	**4 preset PI references** Factory setting: 0 Selecting the assigned logic input activates the function. Check that Pr2 has been assigned before assigning Pr4. 0 = "nO": Not assigned 129 = "LI1": Logic input LI1 130 = "LI2": Logic input LI2 131 = "LI3": Logic input LI3 132 = "LI4": Logic input LI4 133 = "LI5": Logic input LI5 134 = "LI6": Logic input LI6 If LAC = L3, the following assignments are possible: 171 = "Cd11": bit 11 of the CMD control word (page 15) written by Modbus or CANopen 172 = "Cd12": bit 12 of the CMD control word (page 15) written by Modbus or CANopen 173 = "Cd13": bit 13 of the CMD control word (page 15) written by Modbus or CANopen 174 = "Cd14": bit 14 of the CMD control word (page 15) written by Modbus or CANopen 175 = "Cd15": bit 15 of the CMD control word (page 15) written by Modbus or CANopen
11921	2059 / 16	**rP2**	R/W	**2nd preset PI reference** Unit: 0.1% Factory setting: 300 Adjustment range: 0 to 1000 Only active if Pr2 has been enabled by selecting an input.
11922	2059 / 17	**rP3**	R/W	**3rd preset PI reference** Unit: 0.1% Factory setting: 600 Adjustment range: 0 to 1000 Only active if Pr4 has been enabled by selecting an input.
11923	2059 / 18	**rP4**	R/W	**4th preset PI reference** Unit: 0.1% Factory setting: 900 Adjustment range: 0 to 1000 Only active if Pr4 has been enabled by selecting an input.
11960	2059 / 3D	**rSL**	RW0	**Restart error threshold ("wake-up" threshold)** Unit: 0.1 Factory setting: 0 Adjustment range: 0 to 1000 If the "PI" and "Low speed operating time"(tLS) (see page 25) functions are configured at the same time, the PI regulator may attempt to set a speed lower than LSP. This results in unsatisfactory operation which consists of starting, operating at low speed then stopping, and so on… Parameter rSL (restart error threshold) can be used to set a minimum PI error threshold for restarting after a stop at prolonged LSP. The function is inactive if tLS = 0.

Modbus address	CANopen address	Code	Read/ Write	Name/Description/Possible values
11908	2059 / 9	**PII**	R/WS	**Internal PI reference enabled** Factory setting: 0 0 = "nO": The PI regulator reference is Fr1, except for UPdH and UPdt (+/- speed cannot be used as the PI regulator reference). 1 = "YES": The PI regulator reference is internal via parameter rPI.
11920	2059 / 15	**rPI**	R/W	**Internal PI reference** Unit: 0.1% Factory setting: 0 Adjustment range: 0 to 1000
10001	2046 / 2	**bLC**	R/WS	**Brake control configuration** Factory setting: 0 Function active only if LAC = L2 or L3 (page 32). 0 = "nO": Not assigned 2 = "r2": Relay R2 64 = "dO": Logic output AOC If bLC is assigned, parameters FLr (page 48) and brA (page 36) are forced to nO, and parameter OPL (page 49) is forced to YES. bLC is forced to nO if OPL = OAC (page 48). **Caution** This function may be incompatible with other functions (see page 10).
10002	2046 / 3	**brL**	R/WS	**Brake release frequency** Unit: 0.1 Hz Factory setting: According to drive rating Adjustment range: 0 to 100
10006	2046 / 7	**Ibr**	R/WS	**Motor current threshold for brake release** Unit: 0.1 A Factory setting: According to drive rating Adjustment range: 0 to 1.36 In (1) (1) In corresponds to the nominal drive current indicated in the Installation Manual and on the drive rating plate.
10004	2046 / 5	**brt**	R/WS	**Brake release time** Unit: 0.01 s Factory setting: 50 Adjustment range: 0 to 500
10003	2046 / 4	**bEn**	R/WS	**Brake engage frequency threshold** Unit: 0.1 Hz Factory setting: 65535 Adjustment range: 0 to LSP 65535 = "nO": Not set 0 to LSP: Adjustment range in Hz If bLC is assigned and bEn still equals nO, the drive will lock on a bLF fault on the first run command.
10005	2046 / 6	**bEt**	R/WS	**Brake engage time** Unit: 0.01 s Factory setting: 50 Adjustment range: 0 to 500
10007	2046 / 8	**bIP**	R/WS	**Brake release pulse** Factory setting: 0 0 = "nO": Whilst the brake is releasing, the motor torque direction corresponds to the direction of rotation commanded. 1 = "YES": Whilst the brake is releasing, the motor torque direction is always forward, regardless of the direction of operation commanded. ⚠ Check that the motor torque direction for "Forward" control corresponds to the upward direction of the load. If necessary, reverse two motor phases.

Modbus address	CANopen address	Code	Read/ Write	Name/Description/Possible values
9202	203E / 3	**LC2**	R/WS	**Switching for second current limit** Factory setting: 0 Function active only if LAC = L2 or L3 (page 32). Selecting the assigned logic input activates the function. 0 = "nO": Not assigned 129 = "LI1": Logic input LI1 130 = "LI2": Logic input LI2 131 = "LI3": Logic input LI3 132 = "LI4": Logic input LI4 133 = "LI5": Logic input LI5 134 = "LI6": Logic input LI6 If LAC = L3, the following assignments are possible: 171 = "Cd11": bit 11 of the CMD control word (page 15) written by Modbus or CANopen 172 = "Cd12": bit 12 of the CMD control word (page 15) written by Modbus or CANopen 173 = "Cd13": bit 13 of the CMD control word (page 15) written by Modbus or CANopen 174 = "Cd14": bit 14 of the CMD control word (page 15) written by Modbus or CANopen 175 = "Cd15": bit 15 of the CMD control word (page 15) written by Modbus or CANopen CL1 is enabled when the logic input or control word bit is at state 0 (page 25). CL2 is enabled when the logic input or control word bit is at state 1 (page 45).
9203	203E / 4	**CL2**	R/W	**2nd current limit** Unit: 0.1 A Factory setting: 1.5 In (1) Adjustment range: 0.25 to 1.5 In (1) (1) In corresponds to the nominal drive current indicated in the Installation Manual and on the drive rating plate.
8011	2032 / C	**CHP**	R/WS	**Switching, motor 2** Factory setting: 0 Function active only if LAC = L2 or L3 (page 32). 0 = "nO": Not assigned 129 = "LI1": Logic input LI1 130 = "LI2": Logic input LI2 131 = "LI3": Logic input LI3 132 = "LI4": Logic input LI4 133 = "LI5": Logic input LI5 134 = "LI6": Logic input LI6 If LAC = L3, the following assignments are possible: 171 = "Cd11": bit 11 of the CMD control word (page 15) written by Modbus or CANopen 172 = "Cd12": bit 12 of the CMD control word (page 15) written by Modbus or CANopen 173 = "Cd13": bit 13 of the CMD control word (page 15) written by Modbus or CANopen 174 = "Cd14": bit 14 of the CMD control word (page 15) written by Modbus or CANopen 175 = "Cd15": bit 15 of the CMD control word (page 15) written by Modbus or CANopen LI or bit = 0: Motor 1 LI or bit = 1: Motor 2 ⚠ - The motor switching function disables motor thermal protection. An external means of motor thermal protection must therefore be provided. - If you use this function, do not use the tUn auto-tuning function (page 28) on motor 2 and do not configure tUn = rUn or POn. - Changes to parameters are only taken into account when the drive is locked.
9701	2043 / 2	**UnS2**	R/WS	**Nominal motor voltage (motor 2) given on the rating plate** Unit: 1 V Factory setting: According to drive rating Adjustment range: According to drive rating: ATV31●●●M2: 100 to 240 V ATV31●●●M3X: 100 to 240 V ATV31●●●N4: 100 to 500 V ATV31●●●S6X: 100 to 600 V

Modbus address	CANopen address	Code	Read/ Write	Name/Description/Possible values
9702	2043 / 3	**FrS2**	R/WS	**Nominal motor frequency (motor 2) given on the rating plate** Unit: 0.1 Hz Factory setting: if bFr = 50: 500 if bFr = 60: 600 Adjustment range: 100 to 5000 ⚠ The ratio $\frac{\text{UnS (in volts)}}{\text{FrS (in Hz)}}$ must not exceed the following values: ATV31●●●M2: 7 max. ATV31●●●M3X: 7 max. ATV31●●●N4: 14 max. ATV31●●●S6X: 17 max.
9703	2043 / 4	**nCr2**	R/WS	**Nominal motor current (motor 2) given on the rating plate** Unit: 0.1 A Factory setting: According to drive rating Adjustment range: 0.25 to 1.5 In (1) (1) In corresponds to the nominal drive current indicated in the Installation Manual and on the drive rating plate.
9704	2043 / 5	**nSP2**	R/WS	**Nominal motor speed (motor 2) given on the rating plate** Unit: 1 rpm Factory setting: According to drive rating Adjustment range: 0 to 32767 If, rather than the nominal speed, the rating plate indicates the synchronous speed and the slip in Hz or as a %, calculate the nominal speed as follows: Nominal speed = Synchronous speed x $\frac{100 - \text{slip as a \%}}{100}$ or Nominal speed = Synchronous speed x $\frac{50 - \text{slip in Hz}}{50}$ (50 Hz motors) or Nominal speed = Synchronous speed x $\frac{60 - \text{slip in Hz}}{60}$ (60 Hz motors)
9706	2043 / 7	**COS2**	R/WS	**Motor Cos Phi (motor 2) given on the rating plate** Unit: 0.01 Factory setting: According to drive rating Adjustment range: 50 to 100
9707	2043 / 8	**UFt2**	R/W	**Selection of the type of voltage/frequency ratio for motor 2** Factory setting: 2 0 = "L": Constant torque for motors connected in parallel or special motors 1 = "P": Variable torque for pump and fan applications 2 = "n": Sensorless flux vector control for constant torque applications 3 = "nLd": Energy saving, for variable torque applications not requiring high dynamics (behaves in a similar way to the P ratio at no load and the n ratio on load).
9723	2043 / 18	**UFr2**	R/W	**IR compensation/Voltage boost, motor 2** Unit: 1% Factory setting: 20 Adjustment range: 0 to 100 For UFt2 = n or nLd: IR compensation. For UFt2 = L or P: Voltage boost. Used to optimize the torque at very low speed (increase UFr2 if the torque is insufficient). Check that the value of UFr2 is not too high for when the motor is warm (risk of instability). Modifying UFt2 will cause UFr2 to return to the factory setting (20%).
9720	2043 / 15	**FLG2**	R/W	**Frequency loop gain, motor 2** Unit: 1% Factory setting: 20 Adjustment range: 1 to 100 Parameter active only if UFt2 = n or nLd. The FLG2 parameter adjusts the drive's ability to follow the speed ramp based on the inertia of the machine being driven. Too high a gain may result in operating instability.

Modbus address	CANopen address	Code	Read/ Write	Name/Description/Possible values
9721	2043 / 16	**StA2**	R/W	**Frequency loop stability, motor 2** Unit: 1% Factory setting: 20 Adjustment range: 1 to 100 Parameter active only if UFt2 = n or nLd. Used to adapt the return to steady state after a speed transient (acceleration or deceleration), according to the dynamics of the machine. Gradually increase the stability to avoid any overspeed.
9725	2043 / 1A	**SLP2**	R/W	**Slip compensation, motor 2** Unit: 1% Factory setting: 100 Adjustment range: 0 to 150 Parameter active only if UFt2 = n or nLd. Used to adjust the slip compensation value fixed by nominal motor speed. The speeds given on motor rating plates are not necessarily exact. If slip setting < actual slip: the motor is not rotating at the correct speed in steady state. If slip setting > actual slip: the motor is overcompensated and the speed is unstable.
11601	2056 / 2	**LAF**	R/WS	**Forward limit switch** (1) Factory setting: 0 Function active only if LAC = L2 or L3 (page 32). 0 = "nO": Not assigned 129 = "LI1": Logic input LI1 130 = "LI2": Logic input LI2 131 = "LI3": Logic input LI3 132 = "LI4": Logic input LI4 133 = "LI5": Logic input LI5 134 = "LI6": Logic input LI6
11602	2056 / 3	**LAr**	R/WS	**Reverse limit switch** (1) Factory setting: 0 Function active only if LAC = L2 or L3 (page 32). 0 = "nO": Not assigned 129 = "LI1": Logic input LI1 130 = "LI2": Logic input LI2 131 = "LI3": Logic input LI3 132 = "LI4": Logic input LI4 133 = "LI5": Logic input LI5 134 = "LI6": Logic input LI6
11603	2056 / 4	**LAS**	R/WS	**Type of limit switch stop** Factory setting: 2 Function active only if LAC = L2 or L3 (page 32). 0 = "rMP": On ramp 1 = "FSt": Fast stop 2 = "nSt": Freewheel stop

(1) **Caution** This function is incompatible with the "PI Regulator" function (see page 10).

Modbus address	CANopen address	Code	Read/ Write	Name/Description/Possible values
7122	2029 / 17	**Atr**	R/WS	**Automatic restart** This is only possible for 2-wire level detection control (tCC = 2C and tCt = LEL or PFO). Factory setting: 0 0 = "nO": Function inactive 1 = "YES": Automatic restart, after locking on a fault, if the fault has disappeared and the other operating conditions permit the restart. The restart is performed by a series of automatic attempts separated by increasingly longer waiting periods: 1 s, 5 s, 10 s, then 1 min for the following periods. If the restart has not taken place once the configurable time tAr has elapsed, the procedure is aborted and the drive remains locked until it is powered down then powered up. The following faults permit this function: - External fault (EPF) - Loss of 4-20 mA reference (LFF) - CANopen fault (COF) - Line overvoltage (OSF) - Loss of a line phase (PHF) - Loss of a motor phase (OPF) - DC bus overvoltage (ObF) - Motor overload (OLF) - Serial link (SLF) - Drive overheating (OHF) The drive fault relay remains activated if this function is active. The speed reference and the operating direction must be maintained. Check that an automatic restart does not present any danger to personnel or equipment.
7123	2029 / 18	**tAr**	R/WS	**Max. duration of restart process** Factory setting: 0 0 = "5" : 5 minutes 1 = "10" : 10 minutes 2 = "30" : 30 minutes 3 = "1h": 1 hour 4 = "2h": 2 hours 5 = "3h": 3 hours 6 = "Ct": Unlimited (except for Loss of a motor phase OPF and Loss of a line phase PHF faults, when the process is limited to 3 hours) This parameter is active if Atr = YES. It can be used to limit the number of consecutive restarts on a recurrent fault.
7124	2029 / 19	**rSF**	R/WS	**Reset of current fault** Factory setting: 0 0 = "nO": Not assigned 129 = "LI1": Logic input LI1 130 = "LI2": Logic input LI2 131 = "LI3": Logic input LI3 132 = "LI4": Logic input LI4 133 = "LI5": Logic input LI5 134 = "LI6": Logic input LI6
3110	2001 / B	**FLr**	R/WS	**Flying restart (automatic catching a spinning load on ramp)** Factory setting: 0 Used to enable a smooth restart if the run command is maintained after the following events: - Loss of line supply or disconnection - Reset of current fault or automatic restart - Freewheel stop The speed given by the drive resumes from the estimated speed of the motor at the time of the restart, then follows the ramp to the reference speed. This function requires 2-wire control (tCC = 2C) with tCt = LEL or PFO. 0 = "nO": Function inactive 1 = "YES": Function active When the function is operational, it activates on each restart following one of the above events, resulting in a slight delay (1 second max). FLr is forced to nO if brake control (bLC) is assigned (page 44). Do not use the flying restart function (FLr = YES) with auto-tuning on power-up (rSC or POn page 27).

Modbus address	CANopen address	Code	Read/ Write	Name/Description/Possible values
7131	2029 / 20	**EtF**	R/WS	**External fault** Factory setting: 0 0 = "nO": Not assigned 129 = "LI1": Logic input LI1 130 = "LI2": Logic input LI2 131 = "LI3": Logic input LI3 132 = "LI4": Logic input LI4 133 = "LI5": Logic input LI5 134 = "LI6": Logic input LI6 If LAC = L3 and LEt = HIG, the following assignments are possible: 171 = "Cd11": bit 11 of the CMD control word (page 15) written by Modbus or CANopen 172 = "Cd12": bit 12 of the CMD control word (page 15) written by Modbus or CANopen 173 = "Cd13": bit 13 of the CMD control word (page 15) written by Modbus or CANopen 174 = "Cd14": bit 14 of the CMD control word (page 15) written by Modbus or CANopen 175 = "Cd15": bit 15 of the CMD control word (page 15) written by Modbus or CANopen
7090	2028 / 5B	**LEt**	R/WS	**Configuration of external fault** Factory setting: 1 0 = "LO": The external fault is detected when the logic input assigned to EtF changes at state 0. I ⚠ n this case, the external fault can not be assigned to a bit of Modbus or CANopen control word. 1 = "HIG": The external fault is detected when the logic input or the CMD control word bit assigned to EtF changes at state 1. ⚠ If LEt = HIG, EtF is assigned to a bit of Modbus or CANopen control word and there is no EtF fault, the change to LEt = LO causes an EtF external fault. In this case, It is necessary to switch off then to switch on the drive.
7006	2028 / 7	**EPL**	R/WS	**Stop mode in the event of an external fault EPF** Factory setting: 1 0 = "nO": Fault ignored 1 = "YES": Fault with freewheel stop 6 = "rMP": Fault with stop on ramp 7 = "FSt": Fault with fast stop
9611	2042 / C	**OPL**	R/WS	**Configuration of motor phase loss fault** Factory setting: 1 0 = "nO": Function inactive 1 = "YES": Triggering of OPF fault 2 = "OAC": No fault triggered but management of the output voltage in order to avoid an overcurrent when the link with the motor is re-established and flying restart even if FLr = nO. To be used with downstream contactor. OPL is forced to YES if brake control bLC is assigned (page 44). If OPL = OAC, bLC is forced to nO (page 44).
7002	2028 / 3	**IPL**	R/WS	**Configuration of line phase loss fault** Factory setting: 1 except for ATV31●●●M2: 0 This parameter is only active on 3-phase drives. 0 = "nO": Fault ignored 1 = "YES": Fault with fast stop
7008	2028 / 9	**OHL**	R/WS	**Stop mode in the event of a drive overheating fault OHF** Factory setting: 1 0 = "nO": Fault ignored 1 = "YES": Fault with freewheel stop 6 = "rMP": Fault with stop on ramp 7 = "FSt": Fault with fast stop
7009	2028 / A	**OLL**	R/WS	**Stop mode in the event of a motor overload fault OLF** Factory setting: 1 0 = "nO": Fault ignored 1 = "YES": Fault with freewheel stop 6 = "rMP": Fault with stop on ramp 7 = "FSt": Fault with fast stop

Modbus address	CANopen address	Code	Read/ Write	Name/Description/Possible values
7010	2028 / B	**SLL**	R/WS	**Stop mode in the event of a Modbus serial link fault SLF** Factory setting: 1 0 = "nO": Fault ignored 1 = "YES": Fault with freewheel stop 6 = "rMP": Fault with stop on ramp 7 = "FSt": Fault with fast stop This parameter does not apply to the PowerSuite software workshop.
7011	2028 / C	**COL**	R/WS	**Stop mode in the event of a CANopen serial link fault COF** Factory setting: 1 0 = "nO": Fault ignored 1 = "YES": Fault with freewheel stop 6 = "rMP": Fault with stop on ramp 7 = "FSt": Fault with fast stop
7012	2028 / D	**tnL**	R/WS	**Configuration of auto-tuning fault tnF** Factory setting: 1 0 = "nO": Fault ignored (the drive reverts to the factory settings) 1 = "YES": Fault with drive locked. If rSC (see page 27) is other than nO, tnL is forced to YES.
7003	2028 / 4	**LFL**	R/WS	**Stop mode in the event of a loss of 4 - 20 mA signal fault LFF** Factory setting: 0 0 = "nO": Fault ignored (only value possible if CrL3 ⩽ 3 mA, see page 30) 1 = "YES": Fault with freewheel stop 4 = "LFF": The drive switches to the fallback speed (LFF parameter) 5 ="rLS": The drive maintains the speed at which it was operating when the fault occurred, and this speed is saved and stored as a reference until the fault has disappeared. 6 = "rMP": Fault with stop on ramp 7 = "FSt": Fault with fast stop The factory setting of LFL is forced to YES if CrH3 < CrL3 (see page 30) and nO is impossible. ⚠ Before setting LFL to YES, rMP or FSt, check the connection of input AI3. Otherwise, the drive may immediately switch to an LFF fault.
7080	2028 / 51	**LFF**	R/WS	**Fallback speed** Unit: 0.1 Hz Factory setting: 100 Adjustment range: 0 to 5000 Fallback speed setting for stopping in the event of a fault
7007	2028 / 8	**drn**	R/WS	**Derated operation in the event of an overvoltage** Lowers the trip threshold of the USF fault in order to operate on line supplies with 50% voltage drops. Factory setting: 0 0 = "nO": Function inactive 1 = "YES": Function active In this case, a line choke must be used and the performance of the drive cannot be guaranteed.
7004	2028 / 5	**StP**	R/WS	**Controlled stop on mains power break** Factory setting: 0 0 = "nO": Locking of the drive and freewheel stopping of the motor 1 = "MMS": This stop mode uses the inertia to maintain the drive power supply as long as possible. 2 = "rMP": Stop according to the valid ramp (dEC or dE2) 3 = "FSt": Fast stop, the stopping time depends on the inertia and the braking ability of the drive.
7125	2029 / 1A	**InH**	R/WS	**Fault inhibit** Disables all the drive protection devices. Factory setting: 0 ⚠ Inhibiting faults may damage the drive beyond repair. This would invalidate the warranty. 0 = "nO": Not assigned 129 = "LI1": Logic input LI1 130 = "LI2": Logic input LI2 131 = "LI3": Logic input LI3 132 = "LI4": Logic input LI4 133 = "LI5": Logic input LI5 134 = "LI6": Logic input LI6 Fault monitoring is active when the input is at state 0. It is inactive when the input is at state 1.

Configuration and adjustment variables

The following parameters (page 51 and 52) do not revert to their factory setting when using the "Return to factory settings" function.

Modbus address	CANopen address	Code	Read/ Write	Name/Description/Possible values
3120	2001 / 15	**rPr**	R/WS	**Operating time reset to zero** Factory setting: 0 0 = "nO": No 2 = "rtH": Operating time reset to zero The rPr parameter automatically falls back to nO as soon as the reset to zero is performed.
6001	201E / 2	**Add**	R/WS	**Modbus: Drive address** Unit: 1 Factory setting: 1 Adjustment range: 1 to 247
6003	201E / 4	**tbr**	R/WS	**Modbus: Transmission speed** Factory setting: 32 24 = "4.8" : 4800 bps 28 = "9.6" : 9600 bps 32 = "19.2": 19200 bps (Caution: The remote display terminal can only be used with this value.)
6004	201E / 5	**tFO**	R/WS	**Modbus: communication format** Factory setting: 3 2 = "8O1": 8 data bits, odd parity, 1 stop bit 3 = "8E1": 8 data bits, even parity, 1 stop bit (Caution: The remote display terminal can only be used with this value.) 4 = "8n1": 8 data bits, no parity, 1 stop bit 5 = "8n2": 8 data bits, no parity, 2 stop bits
6005	201E / 6	**ttO**	R/WS	**Modbus: Time-out** Unit: 0.1 s Factory setting: 100 Adjustment range: 1 to 100
6051	201E / 34	**AdCO**	R/WS	**CANopen: Drive address** Unit: 1 Factory setting: 0 Adjustment range: 0 to 127
6053	201E / 36	**bdCO**	R/WS	**CANopen: Transmission speed** Factory setting: 52 30 = "10.0": 10 kbps 34 = "20.0": 20 kbps 38 = "50.0": 50 kbps 52 = "125.0": 125 kbps 60 = "250.0": 250 kbps 68 = "500.0": 500 kbps 76 = "1000": 1000 kbps
8431	2036 / 20	**FLO**	R/WS	**Forced local mode** Factory setting: 0 0 = "nO": Not assigned 129 = "LI1": Logic input LI1 130 = "LI2": Logic input LI2 131 = "LI3": Logic input LI3 132 = "LI4": Logic input LI4 133 = "LI5": Logic input LI5 134 = "LI6": Logic input LI6 In forced local mode, the terminal block or display terminal regains control of the drive.
8432	2036 / 21	**FLOC**	R/WS	**Selection of the reference and control channel in forced local mode** Active only if LAC = 3 Factory setting: 1 except for ATV31●●●A: 16 In forced local mode, only the speed reference is taken into account. PI functions, summing inputs, etc. are not active. 1 = "AI1": Analog input AI1, logic inputs LI 2 = "AI2": Analog input AI2, logic inputs LI 3 = "AI3": Analog input AI3, logic inputs LI 16 = "AIP": Potentiometer (type A drives only), RUN, STOP buttons 163 = "LCC": Remote display terminal: LFr reference page 15, RUN, STOP, FWD/REV buttons.

Modbus address	CANopen address	Code	Read/ Write	Name/Description/Possible values
3003	2000 / 4	**COd**	R/W	**Display terminal locking code** Enables the drive configuration to be protected using an access code. When access is locked using a code, only the monitoring parameters can be accessed, with only a temporary choice of parameter displayed. ⚠ **Caution: Before entering a code, do not forget to make a careful note of it.** 0 = OFF: No access locking codes - To lock access, enter a code (2 to 9999). "On" appears on the screen to indicate that access has been locked. 1 = On: A code is locking access (2 to 9999) - To unlock access, enter the code. The code remains on the display and access is unlocked until the next power down. Access will be locked again on the next power-up. - If an incorrect code is entered, COd changes to "On" and access remain locked. 2 to 9999: Access is unlocked (the code remains on the screen) - To reactivate locking with the same code when access is unlocked, return to "On". - To lock access with a new code when access is unlocked, enter the new code. - To disable locking when access is unlocked, return to "OFF".

Replacing an ATV28 with an ATV31

If necessary, it is easy to replace an ATV28 with a ATV31 in an installation communicating via Modbus.
In fact, most of the variables used in the ATV28 are found in the ATV31 with the same addresses (double addressing).

- To replace an ATV28, the ATV28 addresses in this table can be used, but **only these**. **All the other ATV28 addresses must be replaced** with those for the ATV31.
- For any new installation, we recommend using the new addresses, as this enables the number of Modbus requests to be reduced.

ATV 28 address	New address	Code
2	3003	COd
4	4434	CrL3
5	4444	CrH3
6	11101	tCC
10	6001	Add
40	3015	bFr
51	3102	SFr
52	3103	tFr
53	9602	FrS
55	9601	UnS
60	3107	nrd
61	9607	UFt
64	9003	brA
65	9011	Frt
110	5002	r2
151	9611	OPL
152	7002	IPL
155	3110	FLr
190	7007	drn
250	3104	HSP
251	3105	LSP
252	9001	ACC
253	9002	dEC
258	9622	ItH
260	9012	AC2
261	9013	dE2
262	11111	JGF
264	11410	SP2
265	11411	SP3

ATV 28 address	New address	Code
266	11412	SP4
267	11413	SP5
268	11414	SP6
269	11415	SP7
270	11210	IdC
272	11701	tLS
279	11941	rPG
280	11942	rIG
281	11903	FbS
282	11001	Ctd
283	11002	ttd
284	11003	Ftd
286	11301	JPF
287	11940	PIC
340	64001	rOt
400	8501	CMD
401	8502	LFR
402	8504	CMI
440	11920	rPI
450	3203	FrH
451	3202	rFr
453	3204	LCr
454	3207	ULn
455	9630	tHr
456	3209	tHd
457	7121	LFt
458	3201	ETA
459	3206	ETI
460	-	ETI2 (1)

ATV 28 address	New address	Code
462	7201	DP1
464	7202	DP2
466	7203	DP3
468	7204	DP4
478	5240	IOLR
482	5261	AO1R
487	3205	Otr
491	3211	OPr
530	3231	rtH
555	3017	INV
600	8606	ERRD
601	8601	CMDD
602	8603	ETAD
603	8602	LFRD
604	8605	FRHD
605	8604	RFRD
606	8607	SMIL
607	8608	SMIL
608	8609	SMAL
609	8610	SMAL
610	8611	SPAL
611	8612	SPAL
612	8613	SPAT
613	8614	SPDL
614	8615	SPDL
615	8616	SPDT
991	64003	LCC

(1) See the ATV28 communication variables manual.

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Code	Modbus address	CANopen address	Name	Page
AC2	9012	203C / D	2nd acceleration ramp time	36
ACC	9001	203C / 2	Acceleration ramp time	35
AdC	10401	204A / 2	Automatic standstill DC injection	38
AdCO	6051	201E / 34	CANopen: Drive address	51
Add	6001	201E / 2	Modbus: Drive address	51
AI1C	5242	2016 / 2B	Value of analog input AI1	19
AI2C	5243	2016 / 2C	Value of analog input AI2	19
AI3C	5244	2016 / 2D	Value of analog input AI3	19
AIPC	5241	2016 / 2A	Value of analog input AIP (ATV31….A drive potentiometer)	19
AO1R	5261	2016 / 3E	Value of the analog output	19
AO1t	4601	2010 / 2	Configuration of the analog output	30
Atr	7122	2029 / 17	Automatic restart	48
bdCO	6053	201E / 36	CANopen: Transmission speed	51
bEn	10003	2046 / 4	Brake engage frequency threshold	44
bEt	10005	2046 / 6	Brake engage time	44
bFr	3015	2000 / 10	Standard motor frequency	26
bIP	10007	2046 / 8	Brake release pulse	44
bLC	10001	2046 / 2	Brake control configuration	44
brA	9003	203C / 4	Deceleration ramp adaptation	36
brL	10002	2046 / 3	Brake release frequency	44
brt	10004	2046 / 5	Brake release time	44
CCS	8421	2036 / 16	Control channel switching	34
Cd1	8423	2036 / 18	Configuration of control channel 1	33
Cd2	8424	2036 / 19	Configuration of control channel 2	33
CFG	3052	2000 / 35	Source configuration	29
CHCF	8401	2036 / 2	Mixed mode (control channels separated from reference channels)	33
CHP	8011	2032 / C	Switching, motor 2	45
CL2	9203	203E / 4	2nd current limit	45
CLI	9201	203E / 2	Current limit	25
CMD	8501	2037 / 2	Control word	15
CMDD	8601	6040	DRIVECOM control word	12
CMI	8504	2037 / 5	Extended control word	16
CMI1	8541	2037 / 2A	Image of Modbus extended control word	21
CMI2	8542	2037 / 2B	Image of CANopen extended control word	22
COd	3003	2000 / 4	Display terminal locking code	52
COL	7011	2028 / C	Stop mode in the event of a CANopen serial link fault COF	50
COP	8402	2036 / 3	Copy channel 1 to channel 2	34
COS	9606	2042 / 7	Motor Cos Phi given on the rating plate	27
COS2	9706	2043 / 7	Motor Cos Phi (motor 2) given on the rating plate	46
CrH3	4444	200E / 2D	Value for high speed (HSP) on input AI3	30
CrL3	4434	200E / 23	Value for low speed (LSP) on input AI3	30
Ctd	11001	2050 / 2	Motor current threshold	25
dCF	11230	2052 / 1F	Coefficient for dividing the deceleration ramp time for fast stopping	37
dCI	11203	2052 / 4	DC injection via logic input	37
dE2	9013	203C / E	2nd deceleration ramp time	36
dEC	9002	203C / 3	Deceleration ramp time	35
dO	5031	2014 / 20	Analog/logic output AOC/AOV	31
DP1	7201	202A / 2	Past fault No. 1	20
DP2	7202	202A / 3	Past fault No. 2	20
DP3	7203	202A / 4	Past fault No. 3	20
DP4	7204	202A / 5	Past fault No. 4	20
drn	7007	2028 / 8	Derated operation in the event of an overvoltage	50
dSP	11502	2055 / 3	- speed (motorized potentiometer)	42
EP1	7211	202A / C	Status of past fault No. 1	21
EP2	7212	202A / D	Status of past fault No. 2	21

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Code	Modbus address	CANopen address	Name	Page
EP3	7213	202A / E	Status of past fault No. 3	21
EP4	7214	202A / F	Status of past fault No. 4	21
EPL	7006	2028 / 7	Stop mode in the event of an external fault EPF	49
ErCO	6056	201E / 39	CANopen: error word	21
ERRD	8606	603F	Fault code	13
ETA	3201	2002 / 2	Status word	17
ETAD	8603	6041	DRIVECOM status word	13
EtF	7131	2029 / 20	External fault	49
ETI	3206	2002 / 7	Extended status word	18
FbS	11903	2059 / 4	PI feedback multiplication coefficient	42
FCS	8002	2032 / 3	Return to factory settings/Restore configuration	29
FLG	9620	2042 / 15	Frequency loop gain	24
FLG2	9720	2043 / 15	Frequency loop gain, motor 2	46
FLO	8431	2036 / 20	Forced local mode	51
FLOC	8432	2036 / 21	Selection of the reference and control channel in forced local mode	51
FLr	3110	2001 / B	Flying restart (automatic catching a spinning load on ramp)	48
Fr1	8413	2036 / E	Configuration reference 1	32
Fr2	8414	2036 / F	Configuration reference 2	32
FrH	3203	2002 / 4	Frequency reference before ramp (absolute value)	17
FRHD	8605	6043	Speed reference (signed ramp input)	13
FrS	9602	2042 / 3	Nominal motor frequency given on the rating plate	26
FrS2	9702	2043 / 3	Nominal motor frequency (motor 2) given on the rating plate	46
Frt	9011	203C / C	Ramp switching threshold	36
FSt	11204	2052 / 5	Fast stop via logic input	37
Ftd	11003	2050 / 4	Motor frequency threshold	25
HSP	3104	2001 / 5	High speed	24
Ibr	10006	2046 / 7	Motor current threshold for brake release	44
IdC	11210	2052 / B	Level of DC injection braking current activated via logic input or selected as stop mode	37
InH	7125	2029 / 1A	Fault inhibit	50
Inr	9020	203C / 15	Ramp increment	35
INV	3017	2000 / 12	Nominal drive current	23
IOLR	5240	2016 / 29	Value of logic I/O	19
IPL	7002	2028 / 3	Configuration of line phase loss fault	49
ItH	9622	2042 / 17	Motor thermal protection - max. thermal current	24
JF2	11302	2053 / 3	2nd skip frequency	25
JGF	11111	2051 / C	Jog operation reference	41
JOG	11110	2051 / B	Jog operation	41
JPF	11301	2053 / 2	Skip frequency	24
LAC	3006	2000 / 7	Function access level	32
LAF	11601	2056 / 2	Forward limit switch	47
LAr	11602	2056 / 3	Reverse limit switch	47
LAS	11603	2056 / 4	Type of limit switch stop	47
LC2	9202	203E / 3	Switching for second current limit	45
LCC	64003	2262 / 4	Control via remote display terminal	34
LCr	3204	2002 / 8	Current in the motor	17
LEt	7090	2028 / 5B	Configuration of external fault	49
LFD1	8631	2038 / 20	Image of Modbus speed reference	22
LFD2	8632	2038 / 21	Image of CANopen speed reference	22
LFF	7080	2028 / 51	Fallback speed	50
LFL	7003	2028 / 4	Stop mode in the event of a loss of 4 - 20 mA signal fault LFF	50
LFr	8502	2037 / 3	Frequency reference via the bus (signed value)	15
LFR1	8521	2037 / 16	Image of Modbus frequency reference	22
LFR2	8522	2037 / 17	Image of CANopen frequency reference	22
LFRD	8602	6042	Speed reference via the bus (signed value)	12

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Code	Modbus address	CANopen address	Name	Page
LFt	7121	2029 / 16	Last fault	20
LRS1	3250	2002 / 33	Extended status word No. 1	18
LRS3	3252	2002 / 35	Extended status word No. 3	19
LSP	3105	2001 / 6	Low speed	24
nCr	9603	2042 / 4	Nominal motor current given on the rating plate	26
nCr2	9703	2043 / 4	Nominal motor current (motor 2) given on the rating plate	46
NCV	3011	2000 / C	Drive rating	23
nrd	3107	2001 / 8	Random switching frequency	28
nSP	9604	2042 / 5	Nominal motor speed given on the rating plate	27
nSP2	9704	2043 / 5	Nominal motor speed (motor 2) given on the rating plate	46
nSt	11202	2052 / 3	Freewheel stop via logic input	38
OHL	7008	2028 / 9	Stop mode in the event of a drive overheating fault OHF	49
OLL	7009	2028 / A	Stop mode in the event of a motor overload fault OLF	49
OPL	9611	2042 / C	Configuration of motor phase loss fault	49
OPr	3211	2002 / C	Motor power	17
Otr	3205	2002 / 6	Motor torque	17
PIC	11940	2059 / 29	IReversal of the direction of correction of the PI regulator	42
PIF	11901	2059 / 2	PI regulator feedback	42
PII	11908	2059 / 9	Internal PI reference enabled	44
PIR1	8531	2037 / 20	Image of Modbus PI reference	22
PIR2	8532	2037 / 21	Image of CANopen PI reference	22
PISP	8503	2037 / 4	PI regulator reference via the bus	15
Pr2	11909	2059 / A	2 preset PI references	43
Pr4	11910	2059 / B	4 preset PI references	43
PS16	11404	2054 / 5	16 preset speeds	40
PS2	11401	2054 / 2	2 preset speeds	39
PS4	11402	2054 / 3	4 preset speeds	39
PS8	11403	2054 / 4	8 preset speeds	40
PSt	64002	2262 / 3	Stop priority	34
r1	5001	2014 / 2	Relay r1	31
r2	5002	2014 / 3	Relay r2	31
rFC	8411	2036 / C	Reference switching	33
rFr	3202	2002 / 3	Output frequency applied to the motor (signed value)	17
RFRD	8604	6044	Output speed (signed value)	13
rIG	11942	2059 / 2B	PI regulator integral gain	42
rOt	64001	2262 / 2	Direction of operation authorized	35
rP2	11921	2059 / 16	2nd preset PI reference	43
rP3	11922	2059 / 17	3rd preset PI reference	43
rP4	11923	2059 / 18	4th preset PI reference	43
rPG	11941	2059 / 2A	PI regulator proportional gain	42
rPI	11920	2059 / 15	Internal PI reference	44
rPr	3120	2001 / 15	Operating time reset to zero	51
rPS	9010	203C / B	Ramp switching	36
rPt	9004	203C / 5	Type of ramp	35
rrS	11105	2051 / 6	Reverse operation via logic input	30
rSC	9643	2042 / 2C	Cold state stator resistance	27
rSF	7124	2029 / 19	Reset of current fault	48
rSL	11960	2059 / 3D	Restart error threshold ("wake-up" threshold)	43
rtH	3231	2002 / 20	Operating time	17
SA2	11801	2058 / 2	Summing input 2	38
SA3	11802	2058 / 3	Summing input 3	39
SCS	8001	2032 / 2	Saving the configuration	29
SdC1	10403	204A / 4	Level of automatic standstill DC injection current	38
SdC2	10405	204A / 6	2nd level of standstill DC injection current	38
SdS	12001	205A / 2	USPL/USPH scale factor	26

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Code	Modbus address	CANopen address	Name	Page
SFr	3102	2001 / 3	Switching frequency	28
SLL	7010	2028 / B	Stop mode in the event of a Modbus serial link fault SLF	50
SLP	9625	2042 / 1A	Slip compensation	24
SLP2	9725	2043 / 1A	Slip compensation, motor 2	47
SMAL	8609 - 8610	6046 / 2	Max. speed	14
SMIL	8607 - 8608	6046 / 1	Min. speed	14
SP10	11418	2054 / 13	10th preset speed	41
SP11	11419	2054 / 14	11th preset speed	41
SP12	11420	2054 / 15	12th preset speed	41
SP13	11421	2054 / 16	13th preset speed	41
SP14	11422	2054 / 17	14th preset speed	41
SP15	11423	2054 / 18	15th preset speed	41
SP16	11424	2054 / 19	16th preset speed	41
SP2	11410	2054 / B	2nd preset speed	40
SP3	11411	2054 / C	3rd preset speed	40
SP4	11412	2054 / D	4th preset speed	40
SP5	11413	2054 / E	5th preset speed	40
SP6	11414	2054 / F	6th preset speed	40
SP7	11415	2054 / 10	7th preset speed	40
SP8	11416	2054 / 11	8th preset speed	41
SP9	11417	2054 / 12	9th preset speed	41
SPAL	8611 - 8612	6048 / 1	Acceleration - Speed delta	14
SPAT	8613	6048 / 2	Acceleration - Time delta	14
SPDL	8614 - 8615	6049 / 1	Deceleration - Speed delta	14
SPDT	8616	6049 / 2	Deceleration - Time delta	14
SrF	9101	203D / 2	Suppression of the speed loop filter	29
StA	9621	2042 / 16	Frequency loop stability	24
StA2	9721	2043 / 16	Frequency loop stability, motor 2	47
StP	7004	2028 / 5	Controlled stop on mains power break	50
Str	11503	2055 / 4	Save reference	42
Stt	11201	2052 / 2	Normal stop mode	36
tA1	9005	203C / 6	Start of CUS-type acceleration ramp rounded	35
tA2	9006	203C / 7	End of CUS-type acceleration ramp rounded	35
tA3	9007	203C / 8	Start of CUS-type deceleration ramp rounded	35
tA4	9008	203C / 9	End of CUS-type deceleration ramp rounded	35
tAr	7123	2029 / 18	Max. duration of restart process	48
tbr	6003	201E / 4	Modbus: Transmission speed	51
tCC	11101	2051 / 2	2-wire/3-wire control	30
tCt	11102	2051 / 3	Type of 2-wire control	30
tdC	11211	2052 / C	Total DC injection braking time selected as normal stop mode	37
tdC1	10402	204A / 3	Automatic standstill DC injection time	38
tdC2	10404	204A / 5	2nd automatic standstill DC injection time	38
TDM	3210	2002 / B	Max. thermal state reached by the drive	17
tFO	6004	201E / 5	Modbus: communication format	51
tFr	3103	2001 / 4	Maximum output frequency	28
tHd	3209	2002 / A	Drive thermal state	17
tHr	9630	2042 / 1F	Motor thermal state	17
tLS	11701	2057 / 2	Low speed operating time	25
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