

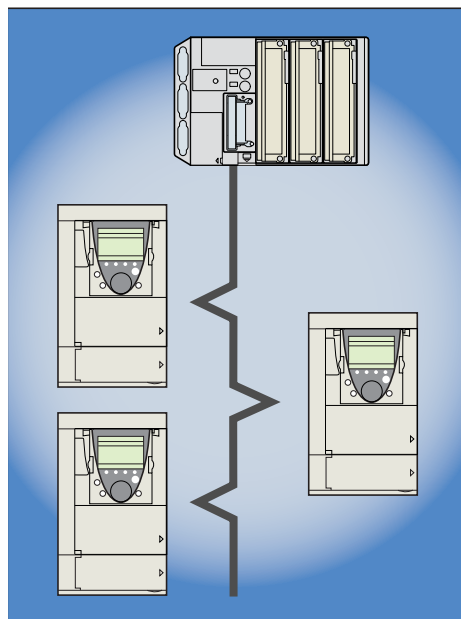
# Altivar 71

Modbus / Uni-Telway card  
Uni-Telway Protocol

## User manual

VW3 A3 303

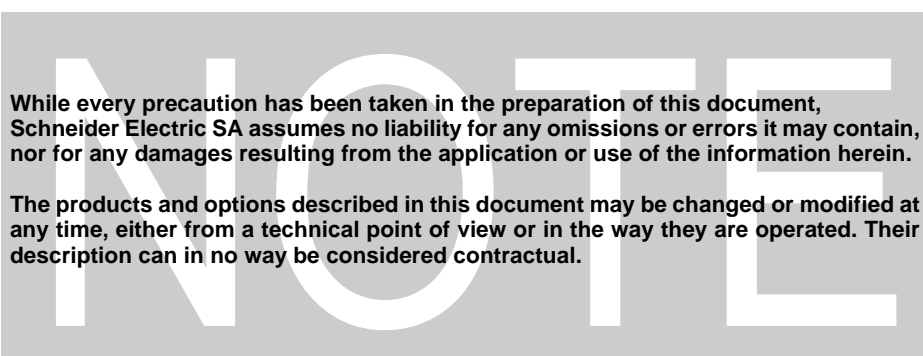
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# 1. Before you begin

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

## DANGER

### HAZARDOUS VOLTAGE

- Read and understand the Installation Manual before installing or operating the ATV71 drive. Installation, adjustment, repair, and maintenance must be performed by qualified personnel.
- The user is responsible for compliance with all international and national electrical standards in force concerning protective grounding of all equipment.
- Many parts of this variable speed drive, including the printed circuit boards, operate at the line voltage. **DO NOT TOUCH.** Use only electrically insulated tools.
- **DO NOT** touch unshielded components or terminal strip screw connections with voltage present.
- **DO NOT** short across terminals PA/+ and PC/- or across the DC bus capacitors.
- Install and close all covers before applying power or starting and stopping the drive.
- Before servicing the variable speed drive
  - Disconnect all power.
  - Place a "DO NOT TURN ON" label on the variable speed drive disconnect.
  - Lock the disconnect in the open position.
- Disconnect all power including external control power that may be present before servicing the drive. **WAIT 15 MINUTES** to allow the DC bus capacitors to discharge. Then follow the DC bus voltage measurement procedure given in the Installation Manual to verify that the DC voltage is less than 45 VDC. The drive LEDs are not accurate indicators of the absence of DC bus voltage.

**Electric shock will result in death or serious injury.**

## CAUTION

### EQUIPMENT DAMAGE

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

## 2. Documentation structure

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The following Altivar 71 technical documents are available on the Web site [www.telemecanique.com](http://www.telemecanique.com) and on the CDROM delivered with each drive.

### ■ Installation Manual

This manual describes:

- How to assemble the drive
- How to connect the drive

### ■ Programming Manual

This manual describes:

- The functions
- The parameters
- How to use the drive display terminal (integrated display terminal and graphic display terminal)

### ■ Communication Parameters Manual

This manual describes:

- The drive parameters with specific information (addresses, formats, etc.) for use via a bus or communication network
- The operating modes specific to communication (state chart)
- The interaction between communication and local control

### ■ Modbus, CANopen, Ethernet, Profibus, INTERBUS, Uni-Telway, DeviceNet, Modbus Plus and FIPIO manuals

These manuals describe:

- Connection to the bus or network
- Configuration of the communication-specific parameters via the integrated display terminal or the graphic display terminal
- Diagnostics
- Software setup
- The communication services specific to the protocol

### ■ Altivar 58/58F Migration Manual

This manual describes the differences between the Altivar 71 and the Altivar 58/58F.

It explains how to replace an Altivar 58 or 58F, including how to replace drives communicating on a bus or network.

## 3. Introduction

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### 3. 1. Presentation

The communication card (catalog number **VW3 A3 303**) is used to connect an Altivar 71 drive to a Uni-Telway or Modbus bus.

This manual only describes how to connect and use the Altivar 71 with a Uni-Telway bus.

The exchanges possible:

- Control
- Monitoring
- Adjustment
- Diagnostics
- Downloading of configuration and adjustment parameters

The card has a 9-way female SUB-D connector for connection to the Uni-Telway bus.

The cables and Uni-Telway bus connection accessories should be ordered separately.

The drive address is configured using the switches on the card.

The graphic display terminal or the integrated display terminal can be used to access numerous functions for communication diagnostics.

### 3. 2. Notation

#### Drive terminal displays

The graphic display terminal menus are shown in square brackets.

Example: [1.9 COMMUNICATION]

The integrated 7-segment display terminal menus are shown in round brackets.

Example: (C D Π -)

Parameter names displayed on the graphic display terminal are shown in square brackets.

Example: [Fallback speed]

Parameter codes displayed on the integrated 7-segment display terminal are shown in round brackets.

Example: (L F F)

#### Formats

Hexadecimal values are written as follows: 16#

Binary values are written as follows: 2#

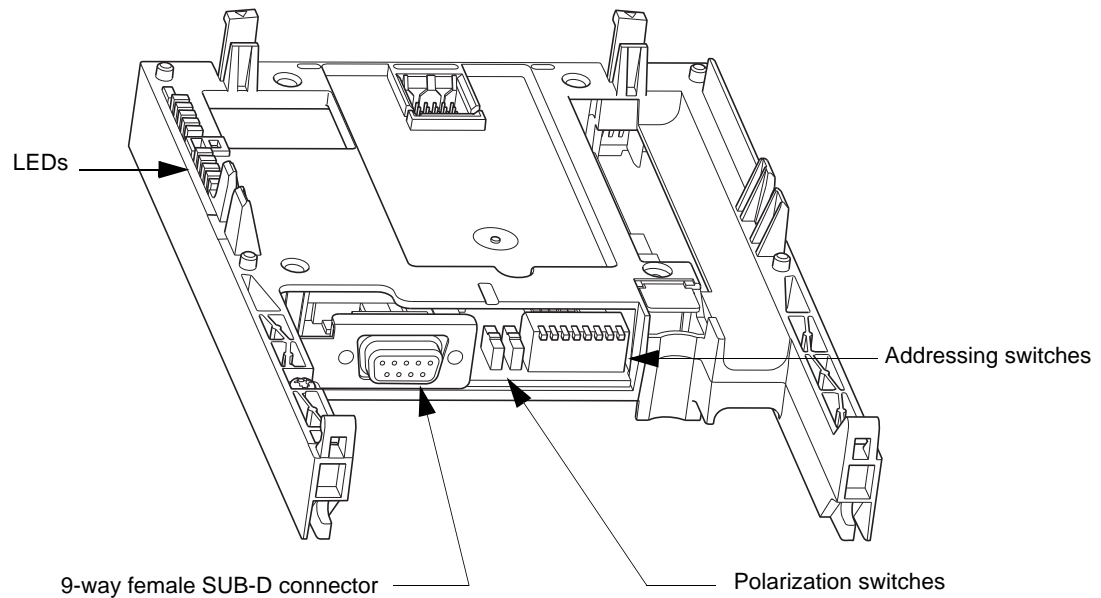
## 4. Hardware setup

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### 4. 1. Receipt

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

### 4. 2. Hardware description



### 4. 3. Installing the card in the drive

See the Installation Manual.

## 4. Hardware setup

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### 4. 4. Switch coding

#### ■ Choosing polarization

Set both switches to the lower position.



Polarization of the RS 485 line at 4.7 kΩ.

#### ■ Coding the address

The switches are used to encode the address (1 to 127) of the drive on the bus.

The switch settings can only be changed when the drive is turned off.

The correspondence between the value and the position of the switch is as follows:

- 0 = OFF = Switch in upper position
- 1 = ON = Switch in lower position

The address is binary-coded.

Examples:



Address 11 = 2#0000 1011



Address 34 = 2#0010 0010

## 4. Hardware setup

The table below indicates the positions of the switches for all configurable addresses:

Address	Switches 1234 5678	Address	Switches 1234 5678	Address	Switches 1234 5678	Address	Switches 1234 5678	Address	Switches 1234 5678
0	0000 0000	52	0011 0100	104	0110 1000	127	1001 1100	127	1101 0000
1	0000 0001	53	0011 0101	105	0110 1001		1001 1101		1101 0001
2	0000 0010	54	0011 0110	106	0110 1010		1001 1110		1101 0010
3	0000 0011	55	0011 0111	107	0110 1011		1001 1111		1101 0011
4	0000 0100	56	0011 1000	108	0110 1100		1010 0000		1101 0100
5	0000 0101	57	0011 1001	109	0110 1101		1010 0001		1101 0101
6	0000 0110	58	0011 1010	110	0110 1110		1010 0010		1101 0110
7	0000 0111	59	0011 1011	111	0110 1111		1010 0011		1101 0111
8	0000 1000	60	0011 1100	112	0111 0000		1010 0100		1101 1000
9	0000 1001	61	0011 1101	113	0111 0001		1010 0101		1101 1001
10	0000 1010	62	0011 1110	114	0111 0010		1010 0110		1101 1010
11	0000 1011	63	0011 1111	115	0111 0011		1010 0111		1101 1011
12	0000 1100	64	0100 0000	116	0111 0100		1010 1000		1101 1100
13	0000 1101	65	0100 0001	117	0111 0101		1010 1001		1101 1101
14	0000 1110	66	0100 0010	118	0111 0110		1010 1010		1101 1110
15	0000 1111	67	0100 0011	119	0111 0111		1010 1011		1101 1111
16	0001 0000	68	0100 0100	120	0111 1000		1010 1100		1110 0000
17	0001 0001	69	0100 0101	121	0111 1001		1010 1101		1110 0001
18	0001 0010	70	0100 0110	122	0111 1010		1010 1110		1110 0010
19	0001 0011	71	0100 0111	123	0111 1011		1010 1111		1110 0011
20	0001 0100	72	0100 1000	124	0111 1100		1011 0000		1110 0100
21	0001 0101	73	0100 1001	125	0111 1101		1011 0001		1110 0101
22	0001 0110	74	0100 1010	126	0111 1110		1011 0010		1110 0110
23	0001 0111	75	0100 1011		0111 1111		1011 0011		1110 0111
24	0001 1000	76	0100 1100		1000 0000		1011 0100		1110 1000
25	0001 1001	77	0100 1101		1000 0001		1011 0101		1110 1001
26	0001 1010	78	0100 1110		1000 0010		1011 0110		1110 1010
27	0001 1011	79	0100 1111		1000 0011		1011 0111		1110 1011
28	0001 1100	80	0101 0000		1000 0100		1011 1000		1110 1100
29	0001 1101	81	0101 0001		1000 0101		1011 1001		1110 1101
30	0001 1110	82	0101 0010		1000 0110		1011 1010		1110 1110
31	0001 1111	83	0101 0011		1000 0111		1011 1011		1110 1111
32	0010 0000	84	0101 0100		1000 1000		1011 1100		1111 0000
33	0010 0001	85	0101 0101		1000 1001		1011 1101		1111 0001
34	0010 0010	86	0101 0110		1000 1010		1011 1110		1111 0010
35	0010 0011	87	0101 0111		1000 1011		1011 1111		1111 0011
36	0010 0100	88	0101 1000		1000 1100		1100 0000		1111 0100
37	0010 0101	89	0101 1001	127	1000 1101		1100 0001		1111 0101
38	0010 0110	90	0101 1010		1000 1110		1100 0010		1111 0110
39	0010 0111	91	0101 1011		1000 1111		1100 0011		1111 0111
40	0010 1000	92	0101 1100		1001 0000		1100 0100		1111 1000
41	0010 1001	93	0101 1101		1001 0001		1100 0101		1111 1001
42	0010 1010	94	0101 1110		1001 0010		1100 0110		1111 1010
43	0010 1011	95	0101 1111		1001 0011		1100 0111		1111 1011
44	0010 1100	96	0110 0000		1001 0100		1100 1000		1111 1100
45	0010 1101	97	0110 0001		1001 0101		1100 1001		1111 1101
46	0010 1110	98	0110 0010		1001 0110		1100 1010		1111 1110
47	0010 1111	99	0110 0011		1001 0111		1100 1011		1111 1111
48	0011 0000	100	0110 0100		1001 1000		1100 1100		
49	0011 0001	101	0110 0101		1001 1001		1100 1101		
50	0011 0010	102	0110 0110		1001 1010		1100 1110		
51	0011 0011	103	0110 0111		1001 1011		1100 1111		

Address 0 should not be used for a Uni-Telway slave.

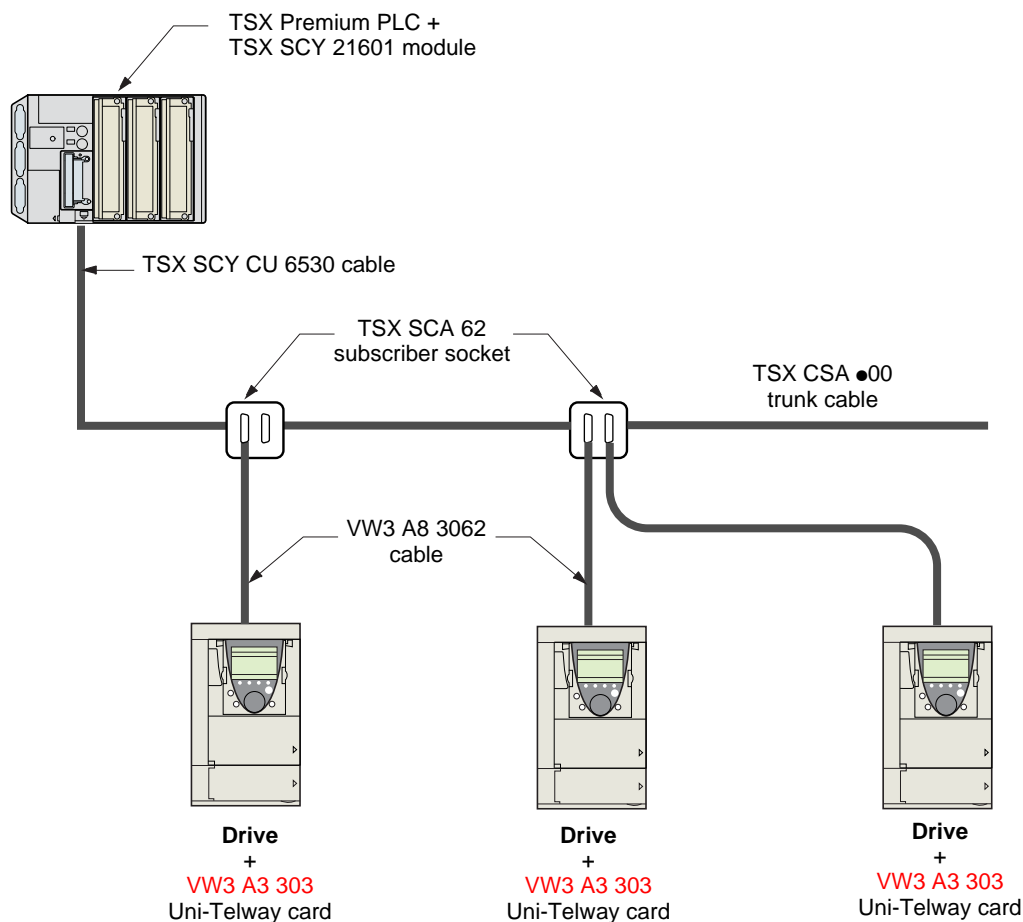


## 5. Connecting to the bus

### 5.1. Connection accessories

Use a drop cable (catalog number VW 3 A8 306 2) and a subscriber socket junction box (catalog number TSX SCA 62).

### 5.2. Wiring example



### 5.3. Wiring recommendations

- Use the Telemecanique cable with 2 pairs of shielded twisted conductors (catalog number TSXCSA100, TSXCSA200 or TSXCSA500).
- Keep the Modbus cable away from the power cables (30 cm minimum).
- Be sure to cross the Modbus cable and the power cables at right angles.
- Whenever possible, connect the cable shielding to the protective ground, e.g., to the ground of each device if this ground is connected to the protective ground.
- Install a line terminator at both ends of the line.
- Ensure the correct polarization of the line.
- Connect the common polarity ("Common" signal) to the protective ground at one or more points on the bus.

For more information, please refer to the "Electromagnetic compatibility of industrial networks and fieldbuses" guide (catalog number TSX DG KBL E).

## 6. Configuration

### 6. 1. Communication parameters

Set the following parameters in the [1.9 - COMMUNICATION], [Uni-Telway / Modbus] (*U E L -*) submenu:

- [Protocol] (*P r D*) to [UNI-TELWAY] (*U E E*)
- [Bit rate] (*b d r*)

These parameters can only be modified when the motor is stopped. Modifications can only be taken into account by the drive following a power break.

Parameter	Possible values	Terminal display	Default value
[Protocol] ( <i>P r D</i> )	Uni-Telway Modbus RTU Modbus ASCII	[Uni-Telway] ( <i>U E E</i> ) [Modbus RTU] ( <i>r t U</i> ) [Modbus ASCII] ( <i>A S C</i> )	Uni-Telway
[Address] ( <i>A d r C</i> )	0-127	[0] ( <i>D</i> ) to [127] ( <i>1 2 7</i> )	Value taken from the address switches
[Bit rate] ( <i>B d r</i> )	4800 bps 9600 bps 19200 bps	[4.8 Kbps] ( <i>4 8</i> ) [9.6 Kbps] ( <i>9 6</i> ) [19.2 Kbps] ( <i>1 9 2</i> )	19200 bps
[Format] ( <i>F D r</i> )	8 data bits, odd parity, 1 stop bit	[8-O-1] ( <i>B a l</i> )	8-O-1

## 6. Configuration

### 6.2. Control - Signaling

Numerous configurations are possible. For more information, refer to the Programming Manual and the Parameters Manual. The following configurations are just some of the possibilities available.

#### ■ Control via Uni-Telway in I/O profile

The command and reference come from Uni-Telway. The command is in I/O profile.

Configure the following parameters:

Parameter	Value	Comment
Profile	I/O profile	The run command is simply obtained by bit 0 of the control word.
Reference 1 configuration	Network card	The reference comes from Uni-Telway.
Command 1 configuration	Network card	The command comes from Uni-Telway.

Configuration via the graphic display terminal or the integrated display terminal:

Menu	Parameter	Value
[1.6 - COMMAND] (C E L -)	[Profile] (C H C F)	[I/O profile] ( I D)
	[Ref.1 channel] (F r I)	[Com. card] (n E E)
	[Cmd channel 1] (C d I)	[Com. card] (n E E)

#### ■ Control via Uni-Telway or the terminals in I/O profile

Both the command and reference come from Uni-Telway or the terminals. Input LI5 at the terminals is used to switch between Uni-Telway and the terminals.

The command is in I/O profile.

Configure the following parameters:

Parameter	Value	Comment
Profile	I/O profile	The run command is simply obtained by bit 0 of the control word.
Reference 1 configuration	Network card	Reference 1 comes from Uni-Telway.
Reference 1B configuration	Analog input 1 on the terminals	Reference 1B comes from input AI1 on the terminals.
Reference switching	Input LI5	Input LI5 switches the reference (1 ↔ 1B).
Command 1 configuration	Network card	Command 1 comes from Uni-Telway.
Command 2 configuration	Terminals	Command 2 comes from the terminals.
Command switching	Input LI5	Input LI5 switches the command.

**Note:** Reference 1B is connected to the functions (summing, PID, etc.), which remain active, even after switching.

Configuration via the graphic display terminal or the integrated display terminal:

Menu	Parameter	Value
[1.6 - COMMAND] (C E L -)	[Profile] (C H C F)	[I/O profile] ( I D)
	[Ref.1 channel] (F r I)	[Com. card] (n E E)
	[Cmd channel 1] (C d I)	[Com. card] (n E E)
	[Cmd channel 2] (C d 2)	[Terminals] (E E r)
	[Cmd switching] (C C S)	[LI5] (L I 5)
[1.7 APPLICATION FUNCT.] (F U n -) [REFERENCE SWITCH.]	[Ref.1B channel] (F r 1b)	[Ref. AI1] (A I I)
	[Ref 1B switching] (r C b)	[LI5] (L I 5)

## 6. Configuration

### ■ Control via Uni-Telway in Drivecom profile

The command and reference come from Uni-Telway.  
The command is in Drivecom profile.

Configure the following parameters:

Parameter	Value	Comment
Profile	Drivecom profile not separate	The run commands are in Drivecom profile, the command and the reference come from the same channel.
Reference 1 configuration	Network card	The command comes from Uni-Telway.

Configuration via the graphic display terminal or the integrated display terminal:

Menu	Parameter	Value
[1.6 - COMMAND] (C E L -)	[Profile] (C H C F)	[Not separ.] (S I N) (factory setting)
	[Ref.1 channel] (F r 1)	[Com. card] (n E t)

### ■ Control via Uni-Telway or the terminals in Drivecom profile

Both the command and reference come from Uni-Telway or the terminals. Input LI5 at the terminals is used to switch between Uni-Telway and the terminals.

The command is in Drivecom profile.

Configure the following parameters:

Parameter	Value	Comment
Profile	Drivecom profile not separate	The run commands follow the Drivecom profile, and the command and reference come from the same channel.
Reference 1 configuration	Network card	Reference 1 comes from Uni-Telway.
Reference 2 configuration	Analog input 1 on the terminals	Reference 2 comes from input AI1 on the terminals.
Reference switching	Input LI5	Input LI5 switches the reference (1 ↔ 2) and the command.

**Note:** Reference 2 is directly connected to the drive reference limit. If switching is performed, the functions that affect the reference (summing, PID, etc.) are inhibited.

Configuration via the graphic display terminal or the integrated display terminal:

Menu	Parameter	Value
[1.6 - COMMAND] (C E L -)	[Profile] (C H C F)	[Not separ.] (S I N)
	[Ref.1 channel] (F r 1)	[Com. card] (n E t)
	[Ref.2 chan] (F r 2)	[Ref. AI1] (A I I)
	[Ref. 2 switching] (r F C)	[LI5] (L I 5)

## 6. Configuration

### ■ Command in Drivecom profile via Uni-Telway and reference switching at the terminals

The command comes from Uni-Telway.

The command comes either from Uni-Telway or from the terminals. Input LI5 at the terminals is used to switch the reference between Uni-Telway and the terminals.

The command is in Drivecom profile.

Configure the following parameters:

Parameter	Value	Comment
Profile	Separate Drivecom profile	The run commands follow the Drivecom profile, and the command and reference can come from different channels.
Reference 1 configuration	Network card	Reference 1 comes from Uni-Telway.
Reference 1B configuration	Analog input 1 on the terminals	Reference 1B comes from input AI1 on the terminals.
Reference switching	Input LI5	Input LI5 switches the reference (1 ↔ 1B).
Command 1 configuration	Network card	Command 1 comes from Uni-Telway.
Command switching	Channel 1	Channel 1 is the command channel.

**Note:** Reference 1B is connected to the functions (summing, PID, etc.), which remain active, even after switching.

Configuration via the graphic display terminal or the integrated display terminal:

Menu	Parameter	Value
[1.6 - COMMAND] (C L L -)	[Profile] (C H C F)	[Separate] (S E P)
	[Ref.1 channel] (F r 1)	[Com. card] (n E t)
	[Cmd channel 1] (C d 1)	[Com. card] (n E t)
	[Cmd switching] (C C S)	[ch1 active] (C d 1)
[1.7 APPLICATION FUNCT.] (F U n -) [REFERENCE SWITCH.]	[Ref.1B channel] (F r 1 b)	[Ref. AI1] (A I 1)
	[Ref 1B switching] (r C b)	[LI5] (L I 5)

## 6. Configuration

### 6.3. Communication scanner

The communication scanner enables all the application-relevant parameters to be grouped in 2 consecutive word tables so that single read and write operations can be performed.

The 8 output variables are assigned by means of the 8 parameters [Scan. Out $\bullet$  address] ( $n\ C\ R\ \bullet$ ). They are configured using the graphic display terminal via the [1.9 - COMMUNICATION] ( $C\ D\ P\ -$ ) menu, [COM. SCANNER OUTPUT] ( $D\ C\ 5\ -$ ) submenu.

The 8 input variables are assigned by means of the 8 parameters [Scan. IN $\bullet$  address] ( $n\ P\ R\ \bullet$ ). They are configured using the graphic display terminal via the [1.9 - COMMUNICATION] ( $C\ D\ P\ -$ ) menu, [COM. SCANNER INPUT] ( $I\ C\ 5\ -$ ) submenu.

Enter the logic address of the parameter (see the Parameters Manual).

If a [Scan. Out $\bullet$  address] ( $n\ C\ R\ \bullet$ ) or [Scan. IN $\bullet$  address] ( $n\ P\ R\ \bullet$ ) parameter is equal to zero, the corresponding variable is not used by the drive.

These 16 assignment parameters are described in the tables below:

Configuration parameter name	Default assignment of the output variable
[Scan. Out1 address] ( $n\ C\ R\ 1$ )	Control word (CMd)
[Scan. Out2 address] ( $n\ C\ R\ 2$ )	Speed reference (LFrd)
[Scan. Out3 address] ( $n\ C\ R\ 3$ )	Not used
[Scan. Out4 address] ( $n\ C\ R\ 4$ )	Not used
[Scan. Out5 address] ( $n\ C\ R\ 5$ )	Not used
[Scan. Out6 address] ( $n\ C\ R\ 6$ )	Not used
[Scan. Out7 address] ( $n\ C\ R\ 7$ )	Not used
[Scan. Out8 address] ( $n\ C\ R\ 8$ )	Not used

Configuration parameter name	Default assignment of the input variable
[Scan. IN1 address] ( $n\ P\ R\ 1$ )	Status word (EtA)
[Scan. IN2 address] ( $n\ P\ R\ 2$ )	Output speed (rFrd)
[Scan. IN3 address] ( $n\ P\ R\ 3$ )	Not used
[Scan. IN4 address] ( $n\ P\ R\ 4$ )	Not used
[Scan. IN5 address] ( $n\ P\ R\ 5$ )	Not used
[Scan. IN6 address] ( $n\ P\ R\ 6$ )	Not used
[Scan. IN7 address] ( $n\ P\ R\ 7$ )	Not used
[Scan. IN8 address] ( $n\ P\ R\ 8$ )	Not used

Example of configuration via the graphic display terminal:

RDY	NET	+0.00Hz	0A
COM. SCANNER INPUT			<input type="checkbox"/>
Scan. IN1 address	:		3201
Scan. IN2 address	:		8604
Scan. IN3 address	:		0
Scan. IN4 address	:		0
Scan. IN5 address	:		0
Code		Quick	<input checked="" type="checkbox"/>
Scan. IN6 address	:		0
Scan. IN7 address	:		0
Scan. IN8 address	:		0

RDY	NET	+0.00Hz	0A
COM. SCANNER OUTPUT			<input type="checkbox"/>
Scan. Out1 address	:		8501
Scan. Out2 address	:		8602
Scan. Out3 address	:		0
Scan. Out4 address	:		0
Scan. Out5 address	:		0
Code		Quick	<input checked="" type="checkbox"/>
Scan. Out6 address	:		0
Scan. Out7 address	:		0
Scan. Out8 address	:		0

**Note:**

Any modification to parameters [Scan. Out $\bullet$  address] ( $n\ C\ R\ \bullet$ ) or [Scan. IN $\bullet$  address] ( $n\ P\ R\ \bullet$ ) must be made with the motor stopped. The master PLC program should be updated to take account of this modification.

## 6. Configuration

### 6. 4. Communication faults

A Uni-Telway fault is triggered if the Uni-Telway card does not receive any polling requests from the master within a predefined time period (time out).

The time out is fixed at 10 s (non-modifiable).

It is possible to configure the response of the drive in the event of a Uni-Telway communication fault.

Configuration can be performed using the graphic display terminal or integrated display terminal via the [\[Network fault mgt\] \(CLL\)](#) parameter in the [\[1.8 – FAULT MANAGEMENT\] \(FL-\)](#) menu [\[COM. FAULT MANAGEMENT\] \(CLL-\)](#) submenu).

RDY	NET	+0.00Hz	0A
COM. FAULT MANAGEMENT			<input type="checkbox"/>
Network fault mgt	:	Freewheel	
CANopen fault mgt	:	Freewheel	
Modbus fault mgt	:	Freewheel	
Code		Quick	<input type="checkbox"/>

The values of the [\[Network fault mgt\] \(CLL\)](#) parameter, which trigger a [\[Com. network\] \(CNF\)](#) drive fault, are:

Value	Meaning
<a href="#">[Freewheel] (Y E 5)</a>	Freewheel stop (factory setting)
<a href="#">[Ramp stop] (r PP)</a>	Stop on ramp
<a href="#">[Fast stop] (F 5 E)</a>	Fast stop
<a href="#">[DC injection] (d E I)</a>	DC injection stop

The values of the [\[Network fault mgt\] \(CLL\)](#) parameter, which do not trigger a drive fault, are:

Value	Meaning
<a href="#">[Ignore] (r D)</a>	Fault ignored
<a href="#">[Per STT] (5 E E)</a>	Stop according to configuration of <a href="#">[Type of stop] (5 E E)</a> .
<a href="#">[fallback spd] (L F F)</a>	Switch to fallback speed, maintained as long as the fault is present and the run command is not disabled.
<a href="#">[Spd maint.] (r L 5)</a>	The drive maintains the speed at the time the fault occurred, as long as the fault persists and the run command has not been removed.

The fallback speed can be configured via the [\[Fallback speed\] \(L F F -\)](#) parameter in the [\[1.8 – FAULT MANAGEMENT\] \(FL-\)](#) menu.

# 6. Configuration

## 6. 5. Monitored parameters

It is possible to select up to 4 parameters to display their values in the [1.2 - MONITORING] menu ([COMMUNICATION MAP] submenu) on the graphic display terminal.

The selection is made via the [6 – MONITORING CONFIG.] menu ([6.3 - COM. MAP CONFIG.] submenu).

Each parameter [Address 1 select] ... [Address 4 select] can be used to choose the logic address of the parameter. Select an address of zero to disable the function.

In the example given here, the monitored words are:

- Parameter 1 = Motor current (LCr): logic address 3204; signed decimal format
- Parameter 2 = Motor torque (Otr): logic address 3205; signed decimal format
- Parameter 3 = Last fault occurred (LFt): logic address 7121; hexadecimal format
- Disabled parameter: address 0; default format: hexadecimal format

RDY	NET	+0.00Hz	0A
6.3 CONFIG. COMM. MAP.			<input type="checkbox"/>
Address 1 select	:		3204
FORMAT 1	:		Signed
Address 2 select	:		3205
FORMAT 2	:		Signed
Address 3 select	:		7121
<b>Code</b>		<b>Quick</b>	<input checked="" type="checkbox"/>
FORMAT 3	:		Hex
Address 4 select	:		0
FORMAT 4	:		Hex

One of the three display formats below can be assigned to each monitored word:

Format	Range	Terminal display
Hexadecimal	0000 ... FFFF	[Hex]
Signed decimal	-32 767 ... 32 767	[Signed]
Unsigned decimal	0 ... 65 535	[Unsigned]



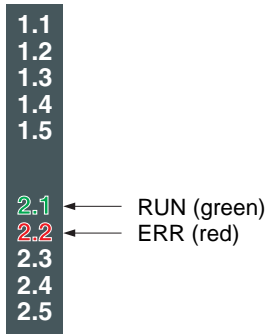
# 7. Diagnostics

## 7. 1. Checking the address

On the graphic display terminal or integrated display terminal, check the address using the [Address] (*A d r C*) parameter in the [1.9 COMMUNICATION] (*C O N -*) menu, [Uni-Telway / Modbus] (*U t L -*) submenu.  
This parameter cannot be modified.

## 7. 2. LEDs

The Uni-Telway card has 2 LEDs, RUN and ERR, which are visible through the drive cover.

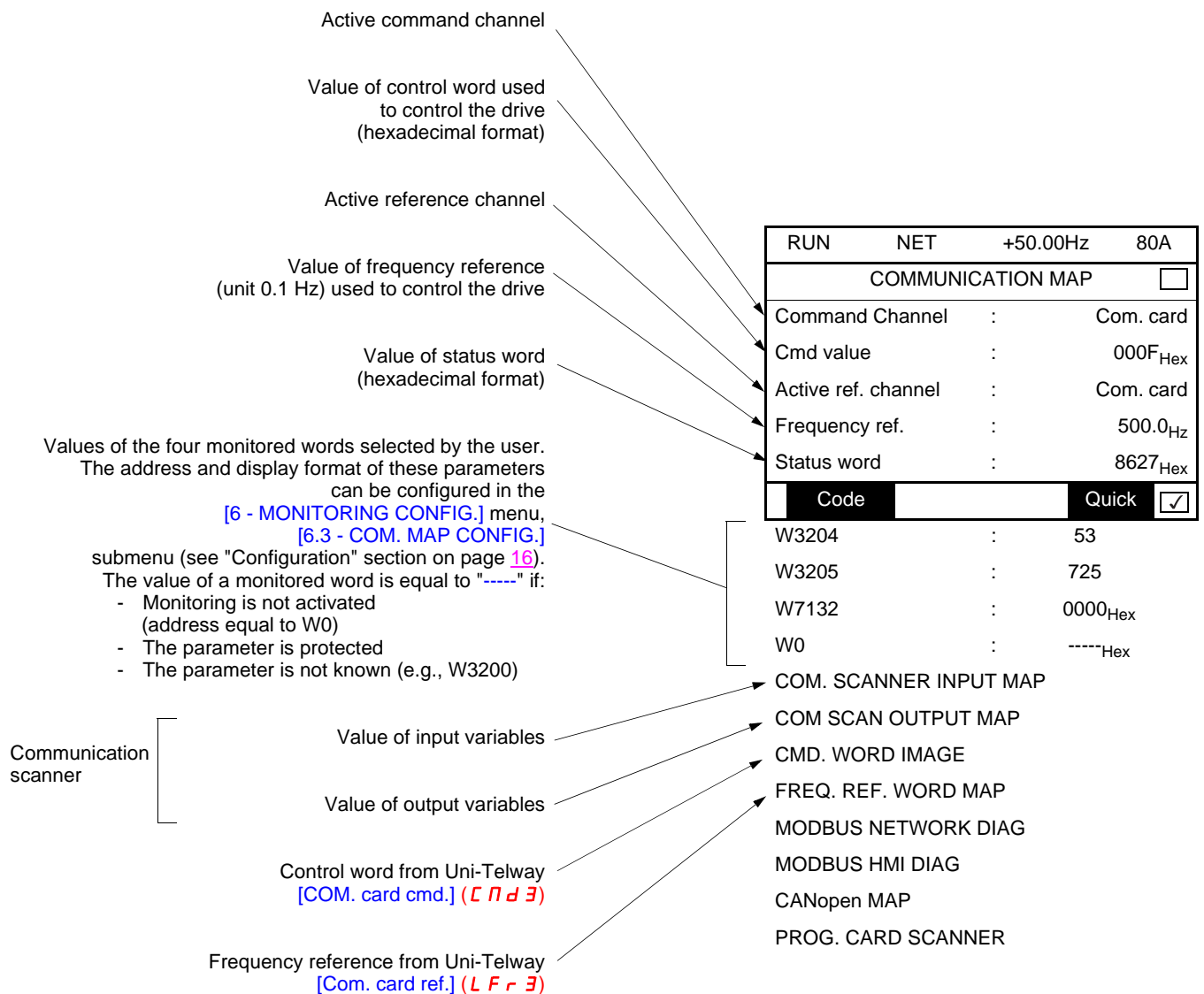


Green RUN LED	Red ERR LED	Meaning	Corrective action
Off	Off	Drive not operating or turned off	Check the power supply.
On	On	Drive starting	
On	Off	Normal operation	
Off	On	Communication fault on the bus	<ul style="list-style-type: none"> <li>• Check the environment (electromagnetic compatibility).</li> <li>• Check the wiring.</li> <li>• Check that the master is communicating within the time out period (= 10 s).</li> </ul>
Off	Flashing	Error on character received	<ul style="list-style-type: none"> <li>• Check the environment (electromagnetic compatibility).</li> <li>• Check the communication parameter configuration (protocol, speed).</li> <li>• Do not forget that the communication parameter configuration is only taken into account by the drive following a power break.</li> <li>• Check that the slave address is unique.</li> </ul>
Flashing	Off	Card fault <a href="#">[internal com. link]</a> (ILF)	<ul style="list-style-type: none"> <li>• Check the environment (electromagnetic compatibility).</li> <li>• Check the card/drive connection.</li> <li>• Check that only one communication card has been installed.</li> <li>• Check that no more than two option cards have been installed.</li> <li>• Replace the communication card.</li> <li>• Inspect or repair the drive.</li> </ul>

# 7. Diagnostics

## 7.3. Control - Signaling

On the graphic display terminal only, the [1.2 - MONITORING] menu ([COMMUNICATION MAP] submenu) can be used to display control-signal diagnostic information between the drive and the master:



# 7. Diagnostics

## 7. 4. Communication scanner

On the graphic display terminal, in the [1.2 - MONITORING] (5 U P -) menu ([COMMUNICATION MAP] (E П П -) submenu):

- The [COM. SCANNER INPUT MAP] ( I S A -) submenu is used to display the value of the 8 communication scanner input variables [Com Scan In● val.] (NM●).
- The [COM SCAN OUTPUT MAP] ( O S A -) submenu is used to display the value of the 8 communication scanner output variables [Com Scan Out● val.] (NC●).

Input variable	Scanner parameter	Output variable	Scanner parameter
Input variable 1	[Com Scan In1 val.] (NM1)	Output variable 1	[Com Scan Out1 val.] (NC1)
Input variable 2	[Com Scan In2 val.] (NM2)	Output variable 2	[Com Scan Out2 val.] (NC2)
Input variable 3	[Com Scan In3 val.] (NM3)	Output variable 3	[Com Scan Out3 val.] (NC3)
Input variable 4	[Com Scan In4 val.] (NM4)	Output variable 4	[Com Scan Out4 val.] (NC4)
Input variable 5	[Com Scan In5 val.] (NM5)	Output variable 5	[Com Scan Out5 val.] (NC5)
Input variable 6	[Com Scan In6 val.] (NM6)	Output variable 6	[Com Scan Out6 val.] (NC6)
Input variable 7	[Com Scan In7 val.] (NM7)	Output variable 7	[Com Scan Out7 val.] (NC7)
Input variable 8	[Com Scan In8 val.] (NM8)	Output variable 8	[Com Scan Out8 val.] (NC8)

Configuration of these variables is described in the "Configuration" section.

Example of communication scanner display on the graphic display terminal:

RUN	NET	+50.00Hz	80A
COM. SCANNER INPUT MAP <input type="checkbox"/>			
Com Scan In1 val.	:		34359
Com Scan In2 val.	:		600
Com Scan In3 val.	:		0
Com Scan In4 val.	:		0
Com Scan In5 val.	:		0
<b>Code</b>		<b>Quick</b>	<input checked="" type="checkbox"/>
Com Scan In6 val.	:		0
Com Scan In7 val.	:		0
Com Scan In8 val.	:		0

RUN	NET	+50.00Hz	80A
COM SCAN OUTPUT MAP <input type="checkbox"/>			
Com Scan Out1 val.	:		15
Com Scan Out2 val.	:		598
Com Scan Out3 val.	:		0
Com Scan Out4 val.	:		0
Com Scan Out5 val.	:		0
<b>Code</b>		<b>Quick</b>	<input checked="" type="checkbox"/>
Com Scan Out6 val.	:		0
Com Scan Out7 val.	:		0
Com Scan Out8 val.	:		0

In this example, only the first two variables have been configured (default assignment).

- [Com Scan In1 val.] = [34343] Status word = 34359 = 16#8637 → Drivecom "Operation enabled" state, reverse operation, speed reached
- [Com Scan In2 val.] = [600] Output speed = 600 → 600 rpm
- [Com Scan Out1 val.] = [15] Control word = 15 = 16#000F → "Enable operation" (Run) command
- [Com Scan Out2 val.] = [598] Speed reference = 600 → 598 rpm

## 7. Diagnostics

### 7. 5. Communication fault

Uni-Telway communication faults are indicated by the red ERR LED on the Uni-Telway card.

In the factory configuration, a communication fault will trigger a resettable [Com. network] (C n F) drive fault and initiate a freewheel stop.

It is possible to change the response of the drive in the event of a Uni-Telway communication fault (see the Configuration section).

- [Com. network] (C n F) drive fault (freewheel stop, stop on ramp, fast stop or DC injection braking stop)
- No drive fault (stop, maintain, fallback)

The Parameters Manual contains a detailed description of how to manage communication faults (see the "Communication monitoring" section).

- Following initialization (power-up), the drive checks that at least one command or reference parameter has been written for the first time by Uni-Telway.
- Then, if a communication fault occurs on Uni-Telway, the drive will react according to the configuration (fault, maintain, fallback, etc.).

### 7. 6. Card fault

The [internal com. link] ( I L F ) fault appears when the following serious problems occur:

- Uni-Telway card hardware fault
- Dialog fault between the Uni-Telway card and the drive

The response of the drive in the event of an [internal com. link] ( I L F ) fault cannot be configured, and the drive trips with a freewheel stop. This fault cannot be reset.

Two diagnostic parameters can be used to obtain more detailed information about the origin of the [internal com. link] ( I L F ) fault:

- [Internal link fault 1] ( I L F 1 ) if the fault has occurred on option card no. 1 (installed directly on the drive)
- [Internal link fault 2] ( I L F 2 ) if the fault has occurred on option card no. 2 (installed on option card no. 1)

The Uni-Telway card can be in position 1 or 2.

The [Internal link fault 1] ( I L F 1 ) and [Internal link fault 2] ( I L F 2 ) parameters can only be accessed on the graphic display terminal in the [1.10 DIAGNOSTICS] ( D G E - ) menu, [MORE FAULT INFO] ( A F I - ) submenu.

Value	Description of the values of the [Internal link fault 1] ( I L F 1 ) and [Internal link fault 2] ( I L F 2 ) parameters
0	No fault
1	Loss of internal communication with the drive
2	Hardware fault detected
3	Error in the EEPROM checksum
4	Faulty EEPROM
5	Faulty Flash memory
6	Faulty RAM memory
7	Faulty NVRAM memory
8	Faulty analog input
9	Faulty analog output
10	Faulty logic input
11	Faulty logic output
101	Unknown card
102	Exchange problem on the drive internal bus
103	Time out on the drive internal bus (500 ms)

## 8. Software setup

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### 8. 1. Services supported

Request	Code	Maximum size
Identification	16#0F	-
Protocol version	16#30	-
Mirror	16#FA	-
Read error counters	16#A2	-
Reset counters	16#A4	-
Read a word	16#04	-
Write a word	16#14	-
Read objects	16#36	63 words, max.
Write objects	16#37	60 words, max.

### 8. 2. Identification request

Drive response:

Response code = 16#3F  
Product type = 16#18 for Altivar 71  
Subtype = 16#71 Altivar 71  
Product version = 16#XX software version (example: 16#21 for V2.1)  
ASCII string\* = drive rating (example: ATV71HU15N4)

\* The first byte of an ASCII string always corresponds to the length of the string.

