Altivar IMC Drive controller
Altivar IMC integrated controller card for Altivar 61 and Altivar 71 variable speed drives
How can you fit a 6000-page catalog in your pocket?

Schneider Electric provides you with the complete set of industrial automation catalogs all on a handy USB key for PC or in an application for tablets.

Digi-Cat, a handy USB key for PC

> Convenient to carry
> Always up-to-date
> Environmentally friendly
> Easy-to-share format

Contact your local representative to get your own Digi-Cat

e-Library, the app for tablets

If you have an iPad®:
> Go to the App Store and search for e-Library
> or scan the QR code

If you have an Android tablet:
> Go to the Google Play Store™ and search for eLibrary
> or scan the QR code
Altivar IMC Drive controller
Altivar IMC integrated controller card for Altivar 61 and Altivar 71 variable speed drives

- Presentation ....................................................................................................................... page 2
- Installation ........................................................................................................................ page 2
- Special features ............................................................................................................... page 2
- Performance ....................................................................................................................... page 3
- Development and technology ......................................................................................... page 3
- Software configuration .................................................................................................. page 3
- Integration in the Schneider Electric product offer ........................................................ page 3
- Functions .......................................................................................................................... page 4
- Functions (continued) ..................................................................................................... page 5
- Communication ............................................................................................................... page 6
- Description ......................................................................................................................... page 6
- References
  - Variable speed drives .................................................................................................... page 7
  - Cards for Altivar 61 and 71 variable speed drives ............................................................. page 7
  - Connection cable ............................................................................................................. page 7

Product reference index ..................................................................................................... page 8
Presentation

The Altivar IMC integrated controller card forms a part of Flexible Machine Control approach, a key component of MachineStruxure™, which brings you maximum flexibility and ensures the most optimised control solution. The Altivar IMC integrated controller card VW3A3521 is a compact optimised solution developed for Altivar 61 and 71 variable speed drives. When equipped with the ATV IMC card, Altivar 61 and 71 drives become controllers capable of meeting the needs of machine manufacturers (OEMs) in applications such as textiles, hoisting, pumping or woodworking, etc.

The Altivar IMC integrated controller card VW3A3521 is configured and programmed using SoMachine software, Please consult on our website www.schneider-electric.com

The expansion capability of the Altivar IMC card is based on Schneider Electric’s “Flexible Machine Control” concept.

The Altivar IMC card boosts the expansion capability of machines and allows us to meet the OEM market’s requirements in terms of performance, simplicity of use and openness.

Installation

The Altivar IMC card is designed for integration on Altivar 61 and 71 variable speed drives in conjunction with other Altivar 61 and 71-specific cards, such as I/O expansion cards and communication cards.

Note: Only one I/O expansion card or communication card can be mounted simultaneously with the Altivar IMC card on an Altivar 61 or 71 drive.

Special features

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>User memory</td>
<td>RAM 2 MB</td>
</tr>
<tr>
<td>Flash</td>
<td>2 MB</td>
</tr>
<tr>
<td>Data storage memory</td>
<td>FRAM 64 KB</td>
</tr>
<tr>
<td>Typical time (for 1000 Boolean instructions)</td>
<td>942 µs</td>
</tr>
<tr>
<td>User program size</td>
<td>1 MB</td>
</tr>
<tr>
<td>Power supply</td>
<td>24 V –</td>
</tr>
<tr>
<td>Inputs</td>
<td>Digital 10 x 24 V ... inputs, 4 of which can be used for 2 high-speed counter inputs (100 kHz) or 2 incremental encoders (A/B) (100 kHz)</td>
</tr>
<tr>
<td></td>
<td>Analog 2 x 0…20 mA inputs</td>
</tr>
<tr>
<td>Outputs</td>
<td>Digital 6 transistor outputs (2 A) - source</td>
</tr>
<tr>
<td></td>
<td>Analog 2 x 0…20 mA outputs</td>
</tr>
<tr>
<td>Built-in communication ports</td>
<td>RJ45 port Ethernet Modbus TCP, Web/FTP Server</td>
</tr>
<tr>
<td></td>
<td>SUB-D connector (male 9-way) Master CANopen bus (16 slaves)</td>
</tr>
<tr>
<td></td>
<td>USB Mini-B port SoMachine software programming</td>
</tr>
<tr>
<td>Real-time clock</td>
<td>Integrated</td>
</tr>
</tbody>
</table>
Performance
Reduce the time it takes to develop your machines
- The use of a single SoMachine programming software environment offers a number of advantages:
  - A single project file
  - A single software program
  - A single download for the whole application
  - The ease of use of PLCopen function blocks significantly reduces the time needed to program motion control and independent axis control on machines.

A more powerful machine
The Altivar IMC integrated controller card has 8 tasks to suit different machine requirements (cyclic, event-triggered, free).
A task can be synchronized with the task of the drive in which it is embedded. This task manages the speed reference, the torque reference, the speed feedback, the torque feedback, the number of encoder pulses feedback in order to increase machine performance.

A more intelligent drive
- Performs more complex operations (2 MB memory)
- Reduces program loading time (Mini-B USB connectors)
- Communication with all the other system devices (built-in Ethernet and CANopen connection ports)

Transparency of your machines
Access to all the other devices in the system architecture via CANopen is totally transparent due to FDT/DTM technology.

Development and technology
The Altivar IMC integrated controller card has been developed with two criteria in mind: low cost and practicality.
- Low cost because the standard equipment for the Altivar IMC card comprises:
  - Sixteen discrete I/O
  - A built-in Ethernet port
  - Two analog inputs
  - Two analog outputs
  - And a CANopen master
- Practicality because the Altivar IMC card is ideal for integration in Altivar 61 and 71 drives, and can therefore use:
  - Their inputs/outputs
  - Their communication cards
  - Their parameters: speed, current, torque, etc.
  - Their remote graphic display terminal
  - And also the inputs/outputs in their I/O expansion cards
  - Plus the speed feedback counter in the encoder interface cards

Software configuration
Configuration and programming of the Altivar IMC integrated controller card and equipment in Schneider Electric’s “Flexible Machine Control” concept are both designed to cut costs and optimize your machine performance.
Schneider Electric’s SoMachine software platform can be used to program Altivar IMC integrated controller card using:
- IEC 61131-3 programming languages: Instruction List (IL), Ladder Diagram (LD), Function Block Diagram (FBD), Sequential Function Chart/Grafcet (SFC) and Structured Text (ST)
- CFC (Continuous Function Chart) language.
PLCopen function blocks are used for managing motion control and axis control on your machines.
Please consult on our website www.schneider-electric.com.

Integration in the Schneider Electric product offer
Combined with other dedicated OEM products in the Schneider Electric offer, such as Altivar variable speed drives, Lexium servo drives, Magelia HMI terminals, TeSys motor starters and contactors, the Altivar IMC integrated controller card can be integrated transparently in a number of architectures.
Altivar IMC Drive controller
Altivar IMC integrated controller card for Altivar 61 and Altivar 71 variable speed drives

**Functions**

**Analog functions**

For machines that require functions to process data issued by analog sensors/actuators (voltage or current), temperature sensors, pressure or PID control sensors, the Altivar IMC card has, as standard, 2 analog inputs (voltage or current) with 10-bit resolution and 2 analog outputs (current) with 10-bit resolution.

1. Altivar IMC integrated controller card installed on Altivar 61
2. Pressure sensor
3. Variable speed pump
4. Fixed speed pumps

**HSC high-speed counting and/or incremental encoder function**

In order to meet requirements for machine productivity, the Altivar IMC has 2 embedded high-speed counters with a counting frequency of 100 kHz for each channel as well as 4 reflex outputs.

The availability of these embedded counters and also the presence of the master CANopen link makes it quick and easy to create low-cost, high-performance multi-axis functions that suit the machines limitations.

With the availability of "PLCopen" function blocks specific to the motion control functions in the SoMachine software, application development is sure to be quick and reliable.

In addition, these high-speed counting inputs can be used as an incremental encoder (A/B) with a frequency of 100 kHz in order to adapt to the machine’s specific requirements.

**Position control function**

Several options are offered in terms of position control:

- Either creating a sequence in Lexium 32 servo drives, with communication with the Altivar IMC integrated controller card achieved by the use of discrete I/O
- Or creating an application in the Altivar IMC card and controlling the Lexium 32A/Lexium 32M servo drives and/or SD3 stepper motor drives via the master CANopen integrated link.
Functions (continued)

**Altivar IMC Drive controller**

Altivar IMC integrated controller card for Altivar 61 and Altivar 71 variable speed drives

---

**Functions (continued)**

### Communication function

#### Ethernet

The Altivar IMC integrated controller card has a built-in RJ45 Ethernet port (10/100 Mbps, MDI/MDIX) with Ethernet TCP Modbus, SoMachine on Ethernet, UDP, TCP and SNMP protocols.

In addition, the Altivar IMC card has an embedded Web Server and FTP Server. As well as the default address based on the MAC address, it is possible to assign a controller IP address via a DHCP server or via a BOOTP server.

#### CANopen

The Altivar IMC integrated controller card has an embedded CANopen master which can be used to control devices on a communication bus with ease.

The link can be configured between 20 kbps and 1 Mbps and supports up to 16 slaves.

Architectures based on CANopen can be used to distribute I/O modules as close to the sensors and actuators as possible, thus reducing wiring costs and times, and to communicate with different devices such as variable speed drives, servo drives, etc.

The CANopen configurator is integrated in the SoMachine software and can also be used to import standard description files in EDS format.

---

### Customization function on the graphic display terminal

**Menu 1.14**

The remote graphic display terminal on Altivar 61 or 71 drives includes a menu dedicated to the Altivar IMC integrated controller card.

The user is offered a graphic display of 8 lines of 24 characters.

This menu can be customized simply and directly using the SoMachine software.

The user can define the language, name, unit, decimal point, and the type of parameter he wishes to customize for his own application. The user can also define alarms and error messages for his application.

---

### Clock function

A time and date-stamping function combined with a clock backed up by a lithium battery makes it possible to keep a log of events that have occurred. When the Altivar IMC integrated controller card is installed in the drive, drive faults are automatically time and date-stamped without the need for any special programming.
Altivar IMC Drive controller
Altivar IMC integrated controller card for Altivar 61 and Altivar 71 variable speed drives

**Communication**
The Altivar IMC integrated controller card has the following built-in communication ports:

<table>
<thead>
<tr>
<th>Communication ports</th>
<th>Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 x RJ45 (MDI/MDIX port)</td>
<td>□ FTP server</td>
</tr>
<tr>
<td></td>
<td>□ Web server</td>
</tr>
<tr>
<td></td>
<td>□ Modbus TCP server</td>
</tr>
<tr>
<td></td>
<td>□ Modbus TCP client</td>
</tr>
<tr>
<td></td>
<td>□ Manager SoMachine</td>
</tr>
<tr>
<td></td>
<td>□ SNMP</td>
</tr>
<tr>
<td></td>
<td>□ Modbus device</td>
</tr>
<tr>
<td>1 x mini-USB</td>
<td>Programming port (480 Mbps)</td>
</tr>
<tr>
<td>1 x 9-way male SUB-D</td>
<td>Master CANopen connection</td>
</tr>
</tbody>
</table>

**Embedded Ethernet**
The Altivar IMC integrated controller card has an embedded Ethernet link via a direct connection to its RJ45 port.
- Speed: “10 BaseT” and “100 BaseTX” with auto-negotiation
- RJ45 port (MDI/MDIX): automatic adaptation to a straight or crossed cable

<table>
<thead>
<tr>
<th>Protocols</th>
<th>Number of connections</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modbus server</td>
<td>8</td>
</tr>
<tr>
<td>Modbus device</td>
<td>2</td>
</tr>
<tr>
<td>FTP server</td>
<td>4</td>
</tr>
<tr>
<td>Web server</td>
<td>10</td>
</tr>
</tbody>
</table>

**Description**
The Altivar IMC integrated controller card comprises:
1. Three spring connectors for:
   - 10 digital inputs
   - 6 digital outputs
   - 2 analog inputs
   - 2 analog outputs
   - 2 commons
2. A connector with removable screw terminals, 3 contacts at intervals of 3.81 for the 24 V supply
3. A mini USB-B connector for programming using SoMachine software
4. A 9-way SUB-D connector for connection to the CANopen machine bus
5. An RJ45 connector for connection of the SoMachine software workshop and/or connection to an Ethernet Modbus TCP network
6. Five LEDs:
   - 1 green/yellow ETH LED for Ethernet activity
   - 1 green/red NS (Network status) LED
   - 1 green/red MS (Module status) LED
   - 1 green/red CAN (CANopen activity) LED
   - 1 green/red LED programmable by the user
7. Four configuration selector switches
# Altivar IMC Drive controller

Altivar IMC integrated controller card for Altivar 61 and Altivar 71 variable speed drives

## Variable speed drives

<table>
<thead>
<tr>
<th>Designation</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Altivar 61 variable speed drives</td>
<td>Refer to the “Altivar 61 variable speed drives” catalogue or visit our website <a href="http://www.schneider-electric.com">www.schneider-electric.com</a></td>
</tr>
<tr>
<td>Altivar 71 variable speed drives</td>
<td>Refer to the “Altivar 71 variable speed drives” catalogue or visit our website <a href="http://www.schneider-electric.com">www.schneider-electric.com</a></td>
</tr>
</tbody>
</table>

## Cards for Altivar 61 and 71 variable speed drives

### Altivar IMC integrated controller card

<table>
<thead>
<tr>
<th>Designation</th>
<th>Voltage</th>
<th>Reference</th>
<th>Weight kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Altivar IMC integrated controller card</td>
<td>24 V</td>
<td>VW3A3521</td>
<td>0.185</td>
</tr>
</tbody>
</table>

### I/O expansion cards (1)

<table>
<thead>
<tr>
<th>Designation</th>
<th>Type of I/O</th>
<th>Reference</th>
<th>Weight kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>I/O expansion cards (2)</td>
<td></td>
<td>VW3A3201</td>
<td>0.300</td>
</tr>
<tr>
<td></td>
<td></td>
<td>VW3A3202</td>
<td>0.300</td>
</tr>
</tbody>
</table>

(1) Altivar 61 and 71 variable speed drives can only take one I/O expansion card with the same reference.

For more information about digital I/O cards, visit our website www.schneider-electric.com.

## Communication cards

<table>
<thead>
<tr>
<th>Designation</th>
<th>Protocols available (depending on model)</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>VW3A33 communication cards</td>
<td>□ Modbus Plus □ Uni-Telway □ InterBus-S □ Profinet □ DeviceNet □ Ethernet Modbus TCP □ Fipio □ EtherNet IP □ CC-Link □ Lonworks (ATV 61) □ METASYS N2 (ATV 61) □ APOGEE FLN (ATV 61) □ BACnet (ATV 61)</td>
<td>Refer to “Altivar 61 variable speed drives” or “Altivar 71 variable speed drives” catalogue, or visit our website <a href="http://www.schneider-electric.com">www.schneider-electric.com</a></td>
</tr>
</tbody>
</table>

## Connection cable

<table>
<thead>
<tr>
<th>Designation</th>
<th>Use</th>
<th>Length</th>
<th>Reference</th>
<th>Weight kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Programming cable</td>
<td>From the mini USB-B port on the Altivar IMC integrated controller card to the type A USB port on the PC terminal for programming and updating firmware</td>
<td>3 m</td>
<td>TCSXCNAMUM3P</td>
<td>0.065</td>
</tr>
</tbody>
</table>

(2) This PTC probe input must never be used to protect an ATEX motor in applications in explosive atmospheres. Please refer to the ATEX guide which is available on our website “www.schneider-electric.com”.
### Altivar IMC Drive controller
Altivar IMC integrated controller card for Altivar 61 and Altivar 71 variable speed drives

<table>
<thead>
<tr>
<th></th>
<th>TCSXCNUMUM3P</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>V</td>
<td>VW3A3201</td>
<td>7</td>
</tr>
<tr>
<td>V</td>
<td>VW3A3202</td>
<td>7</td>
</tr>
<tr>
<td>V</td>
<td>VW3A3521</td>
<td>7</td>
</tr>
</tbody>
</table>
The information provided in this documentation contains general descriptions and/or technical characteristics of the performance of the products contained herein. This documentation is not intended as a substitute for and is not to be used for determining suitability or reliability of these products for specific user applications. It is the duty of any such user or integrator to perform the appropriate and complete risk analysis, evaluation and testing of the products with respect to the relevant specific application or use thereof. Neither Schneider Electric nor any of its affiliates or subsidiaries shall be responsible or liable for misuse of the information contained herein.

Design: Schneider Electric
Photos: Schneider Electric