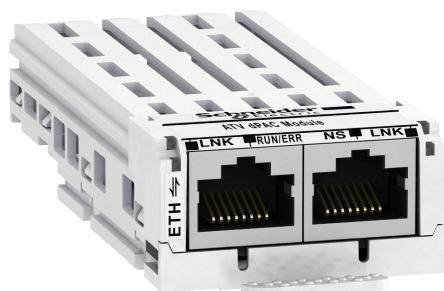


Altivar dPAC Module VW3A3530D

User Guide

11/2022

NNZ13577.05



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Safety Information

Important Information

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



The addition of this symbol to a “Danger” or “Warning” safety label indicates that an electrical hazard exists which will result in personal injury if the instructions are not followed.



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

DANGER

DANGER indicates a hazardous situation which, if not avoided, **will result in** death or serious injury.

WARNING

WARNING indicates a hazardous situation which, if not avoided, **could result in** death or serious injury.

CAUTION

CAUTION indicates a hazardous situation which, if not avoided, **could result in** minor or moderate injury.

NOTICE

NOTICE is used to address practices not related to physical injury.

Please Note

Electrical equipment should be installed, operated, serviced, and maintained only by qualified personnel. No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material.

A qualified person is one who has skills and knowledge related to the construction and operation of electrical equipment and its installation, and has received safety training to recognize and avoid the hazards involved.

Qualification Of Personnel

Only appropriately trained persons who are familiar with and understand the contents of this manual and all other pertinent product documentation are authorized to work on and with this product. In addition, these persons must have received safety training to recognize and avoid hazards involved. These persons must have sufficient technical training, knowledge and experience and be able to foresee and detect potential hazards that may be caused by using the product, by changing the settings and by the mechanical, electrical and electronic equipment of the entire system in which the product is used. All persons working on and with the product must be fully familiar with all applicable standards, directives, and accident prevention regulations when performing such work.

Intended Use

This product is a drive for three-phase synchronous and asynchronous motors and intended for industrial use according to this manual. The product may only be used in compliance with all applicable safety regulations and directives, the specified requirements and the technical data. Prior to using the product, you must perform a risk assessment in view of the planned application. Based on the results, the appropriate safety measures must be implemented. Since the product is used as a component in an entire system, you must ensure the safety of persons by means of the design of this entire system (for example, machine design). Any use other than the use explicitly permitted is prohibited and can result in hazards. Electrical equipment should be installed, operated, serviced, and maintained only by qualified personnel.

Before You Begin

Do not use this product on machinery lacking effective point-of-operation guarding. Lack of effective point-of-operation guarding on a machine can result in serious injury to the operator of that machine.

WARNING

UNGUARDED EQUIPMENT

- Do not use this software and related automation equipment on equipment which does not have point-of-operation protection.
- Do not reach into machinery during operation.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

This automation equipment and related software is used to control a variety of industrial processes. The type or model of automation equipment suitable for each application will vary depending on factors such as the control function required, degree of protection required, production methods, unusual conditions, government regulations, etc. In some applications, more than one processor may be required, as when backup redundancy is needed.

Only you, the user, machine builder or system integrator can be aware of all the conditions and factors present during setup, operation, and maintenance of the machine and, therefore, can determine the automation equipment and the related safeties and interlocks which can be properly used. When selecting automation and control equipment and related software for a particular application, you should refer to the applicable local and national standards and regulations. The National Safety Council's Accident Prevention Manual (nationally recognized in the United States of America) also provides much useful information.

In some applications, such as packaging machinery, additional operator protection such as point-of-operation guarding must be provided. This is necessary if the

operator's hands and other parts of the body are free to enter the pinch points or other hazardous areas and serious injury can occur. Software products alone cannot protect an operator from injury. For this reason the software cannot be substituted for or take the place of point-of-operation protection.

Ensure that appropriate safeties and mechanical/electrical interlocks related to point-of-operation protection have been installed and are operational before placing the equipment into service. All interlocks and safeties related to point-of-operation protection must be coordinated with the related automation equipment and software programming.

NOTE: Coordination of safeties and mechanical/electrical interlocks for point-of-operation protection is outside the scope of the Function Block Library, System User Guide, or other implementation referenced in this documentation.

Start-up And Test

Before using electrical control and automation equipment for regular operation after installation, the system should be given a start-up test by qualified personnel to verify correct operation of the equipment. It is important that arrangements for such a check be made and that enough time is allowed to perform complete and satisfactory testing.

WARNING

EQUIPMENT OPERATION HAZARD

- Verify that all installation and set up procedures have been completed.
- Before operational tests are performed, remove all blocks or other temporary holding means used for shipment from all component devices.
- Remove tools, meters, and debris from equipment.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Follow all start-up tests recommended in the equipment documentation. Store all equipment documentation for future references.

Software testing must be done in both simulated and real environments.

Verify that the completed system is free from all short circuits and temporary grounds that are not installed according to local regulations (according to the National Electrical Code in the U.S.A, for instance). If high-potential voltage testing is necessary, follow recommendations in equipment documentation to prevent accidental equipment damage.

Before energizing equipment:

- Remove tools, meters, and debris from equipment.
- Close the equipment enclosure door.
- Remove all temporary grounds from incoming power lines.
- Perform all start-up tests recommended by the manufacturer.

Operation And Adjustments

The following precautions are from the NEMA Standards Publication ICS 7.1-1995 (English version prevails):

- Regardless of the care exercised in the design and manufacture of equipment or in the selection and ratings of components, there are hazards that can be encountered if such equipment is improperly operated.

- It is sometimes possible to misadjust the equipment and thus produce unsatisfactory or unsafe operation. Always use the manufacturer's instructions as a guide for functional adjustments. Personnel who have access to these adjustments should be familiar with the equipment manufacturer's instructions and the machinery used with the electrical equipment.
- Only those operational adjustments actually required by the operator should be accessible to the operator. Access to other controls should be restricted to prevent unauthorized changes in operating characteristics.

Product Related Information

⚠ WARNING

LOSS OF CONTROL

- The designer of any control scheme must consider the potential failure modes of control paths and, for critical control functions, provide a means to achieve a safe state during and after a path failure. Examples of critical control functions are emergency stop, overtravel stop, power outage and restart.
- Separate or redundant control paths must be provided for critical control functions.
- System control paths may include communication links. Consideration must be given to the implications of unanticipated transmission delays or failures of the link.
- Observe all accident prevention regulations and local safety guidelines (1).
- Each implementation of the product must be individually and thoroughly tested for proper operation before being placed into service.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

(1) For USA: Additional information, refer to NEMA ICS 1.1 (latest edition), Safety Guidelines for the Application, Installation, and Maintenance of Solid State Control and to NEMA ICS 7.1 (latest edition), Safety Standards for Construction and Guide for Selection, Installation and Operation of Adjustable-Speed Drive Systems.

About the Book

Document Scope

The purpose of this document is to:

- Guide you to set up the drive.
- Show you how to program the drive.
- Visualize different menus, modes, and parameters.
- Help you in maintenance and diagnostics.

Validity Note

This documentation is valid for the Altivar drives.

The technical characteristics of the devices described in the present document also appear online. To access the information online:

Step	Action
1	Go to the Schneider Electric home page www.se.com .
2	In the Search box type the reference of a product or the name of a product range. • Do not include blank spaces in the reference or product range. • To get information on grouping similar modules, use asterisks (*).
3	If you entered a reference, go to the Product Datasheets search results and click on the reference that interests you. If you entered the name of a product range, go to the Product Ranges search results and click on the product range that interests you.
4	If more than one reference appears in the Products search results, click on the reference that interests you.
5	Depending on the size of your screen, you may need to scroll down to see the datasheet.
6	To save or print a datasheet as a .pdf file, click Download XXX product datasheet .

The characteristics that are described in the present document should be the same as those characteristics that appear online. In line with our policy of constant improvement, we may revise content over time to improve clarity and accuracy. If you see a difference between the document and online information, use the online information as your reference.

Related Documents

Use your tablet or your PC to quickly access detailed and comprehensive information on all our products on www.se.com.

The website provides the information you need for products and solutions:

- The whole catalog for detailed characteristics and selection guides.
- The CAD files to help design your installation, available in over 20 different file formats.
- All software and firmware to maintain your installation up to date,
- A large quantity of White Papers, Environment documents, Application solutions, Specifications to gain a better understanding of our electrical systems and equipment or automation.
- All the User Guides related to your drive are listed below:

Title of Documentation	Reference Number
Altivar Lexium - Instruction Sheet - Option Modules	S1A45591 (English)
ATV dPAC user guide	NNZ13577 (English), NNZ13578 (French), NNZ13579 (German), NNZ13580 (Spanish), NNZ13581 (Italian), NNZ13582 (Chinese), NNZ13583 (Portuguese)
Getting Started with ATV dPAC VW3A3530D	JYT50503.01
ATV340 Getting Started - Video	FAQ FA367923 (English)
ATV340 Getting Started	NVE37643 (English), NVE37642 (French), NVE37644 (German), NVE37646 (Spanish), NVE37647 (Italian), NVE37648 (Chinese), NVE37643PT (Portuguese), NVE37643TR (Turkish)
ATV340 Installation Manual	NVE61069 (English), NVE61071 (French), NVE61074 (German), NVE61075 (Spanish), NVE61078 (Italian), NVE61079 (Chinese), NVE61069PT (Portuguese), NVE61069TR (Turkish)
ATV340 Programming Manual	NVE61643 (English), NVE61644 (French), NVE61645 (German), NVE61647 (Spanish), NVE61648 (Italian), NVE61649 (Chinese), NVE61643PT (Portuguese), NVE61643TR (Turkish)
ATV6xx Getting Started	EAV63253 (English), EAV63254 (French), EAV63255 (German), EAV63256 (Spanish), EAV63257 (Italian), EAV64298 (Chinese), EAV63253PT (Portuguese), EAV63253TR (Turkish)
ATV6xx Installation Manual	EAV64301 (English), EAV64302 (French), EAV64306 (German), EAV64307 (Spanish), EAV64310 (Italian), EAV64317 (Chinese), EAV64301PT (Portuguese), EAV64301TR (Turkish)
ATV6xx Programming Manual	EAV64318 (English), EAV64320 (French), EAV64321 (German), EAV64322 (Spanish), EAV64323 (Italian), EAV64324 (Chinese), EAV64318PT (Portuguese), EAV64318TR (Turkish)
ATV9xx Getting Started	NHA61578 (English), NHA61579 (French), NHA61580 (German), NHA61581 (Spanish), NHA61724 (Italian), NHA61582 (Chinese), NHA61578PT (Portuguese), NHA61578TR (Turkish)
ATV9xx Installation manual	NHA80932 (English), NHA80933 (French), NHA80934 (German), NHA80935 (Spanish), NHA80936 (Italian), NHA80937 (Chinese), NHA80932PT (Portuguese), NHA80932TR (Turkish)
ATV9xx Programming manual	NHA80757 (English), NHA80758 (French), NHA80759 (German), NHA80760 (Spanish), NHA80761 (Italian), NHA80762 (Chinese), NHA80757PT (Portuguese), NHA80757TR (Turkish)
Recommended Cybersecurity Best Practices	CS-Best-Practices-2019-340 (English)

You can download these technical publications and other technical information from our website at www.se.com/en/download

Terminology

The technical terms, terminology, and the corresponding descriptions in this manual normally use the terms or definitions in the relevant standards.

In the area of drive systems this includes, but is not limited to, terms such as **error**, **error message**, **failure**, **fault**, **fault reset**, **protection**, **safe state**, **safety function**, **warning**, **warning message**, and so on.

Among others, these standards include:

- IEC 61800 series: Adjustable speed electrical power drive systems
- IEC 61508 Ed.2 series: Functional safety of electrical/electronic/programmable electronic safety-related
- EN 954-1 Safety of machinery - Safety related parts of control systems

- EN ISO 13849-1 & 2 Safety of machinery - Safety related parts of control systems.
- IEC 61158 series: Industrial communication networks - Fieldbus specifications
- IEC 61784 series: Industrial communication networks - Profiles
- IEC 60204-1: Safety of machinery - Electrical equipment of machines – Part 1: General requirements

In addition, the term **zone of operation** is used in conjunction with the description of specific hazards, and is defined as it is for a **hazard zone** or **danger zone** in the EC Machinery Directive (2006/42/EC) and in ISO 12100-1.

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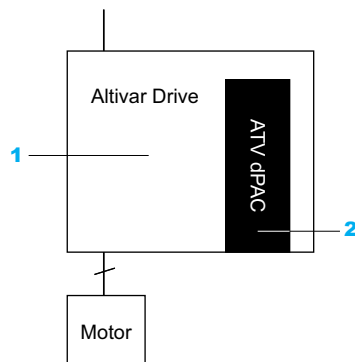
France

ATV dPAC General Hardware Overview

ATV dPAC Description

Overview

The ATV dPAC (for Altivar distributed Process Automation Controller) is an option module (2) for Altivar variable speed drives (1). The catalog number of this option module is VW3A3530D.



This option module is a controller being part of EcoStruxure Automation Expert controller offer. ATV dPAC has various powerful features, can service a wide range of applications and adapts the Altivar drives to specific applications by integrating control system functions.

Software configuration, programming, and commissioning are achieved with the EcoStruxure Automation Expert software described in the EcoStruxure Automation Expert Programming Guide.

Power Supply

The power supply of ATV dPAC is provided by the host Altivar Drive (See Electrical Requirements, page 29).

Run/Stop

The ATV dPAC can be operated externally by an EcoStruxure Automation Expert software command.

Memory

This table describes the different types of memory embedded to the ATV dPAC:

Memory Type	Size	Used
RAM	16 Mbytes of which 12 Mbytes available for the application and communication services	To execute the application.
Flash	16 Mbytes	To save the program (and data in case of a power interruption).

Communication Features

The ATV dPAC communication ports include Ethernet (See Ethernet Port, page 34).

Altivar Drive Features

The ATV dPAC can control or use the information coming from the following drives interfaces:

- Variable Speed Drive interface (part controlling the motor),
- Inputs and outputs embedded to the drive (such as digital inputs, analog inputs, analog outputs and relays).

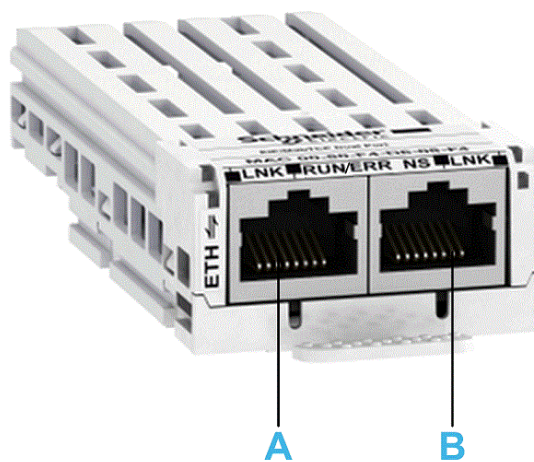
NOTE: The following are supported from ATV dPAC software version **V3.1IE03:**

- ATV340 embedded encoder (available on drives with power equal to or lower than 22 kW),
- VW3A3420, VW3A3422, VW3A3423 and VW3A3424 option encoder interface modules (digital, analog, resolver and HTL),
- VW3A3203 extended I/O module,
- VW3A3204 extended relay module.

ATV dPAC Hardware Presentation

Overview

The following figure shows the VW3A3530D ATV dPAC module with one dual port Ethernet switch:



Item	Description	Comment
A	Port A	RJ45 connector - Ethernet port
B	Port B	RJ45 connector - Ethernet port

Firmware Version Compatibility

The ATV dPAC is compatible with:

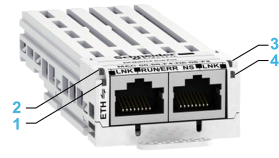
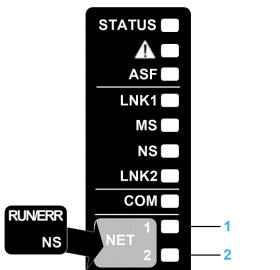
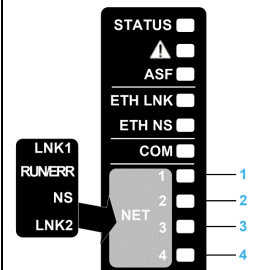
- ATV340 drives with, at least, V1.8IE94 software version.

- Altivar Process ATV600 (ATV630, ATV650) drives with, at least, V2.6IE94 software version
- Altivar Process ATV900 (ATV930, ATV950) drives with, at least, V2.3IE94 software version.

In case of incompatible version between the drive and the ATV dPAC, **[Internal Error 6]** is triggered. A firmware update can be performed using EcoStruxure Automation Device Maintenance. For more information contact your local Schneider Electric Services.

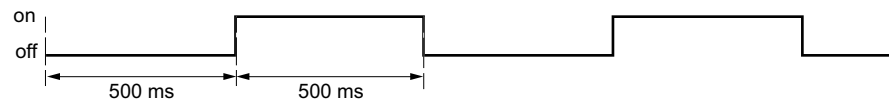
Status LEDs

The following figures shows the LED indicators depending on the host Altivar drive:

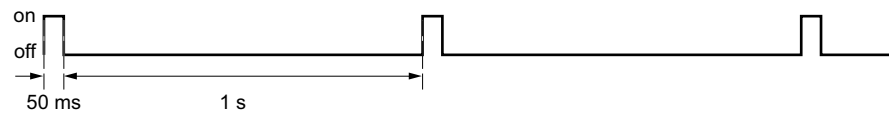
ATV340 (power ≤ 22 kW)	ATV340 (power > 22 kW) ATV900	ATV600
Display on ATV dPAC	Display on the control block of the host drive	Display on the control block of the host drive
		
Legend: 1 LNK1 – 2 RUN/ERR 3 NS – 4 LNK2	1 RUN/ERR – 2 NS	1 LNK1 – 2 RUN/ERR 3 NS – 4 LNK2

This figure shows the difference between the fast flash and the slow flash:

Blinking



Single Flash



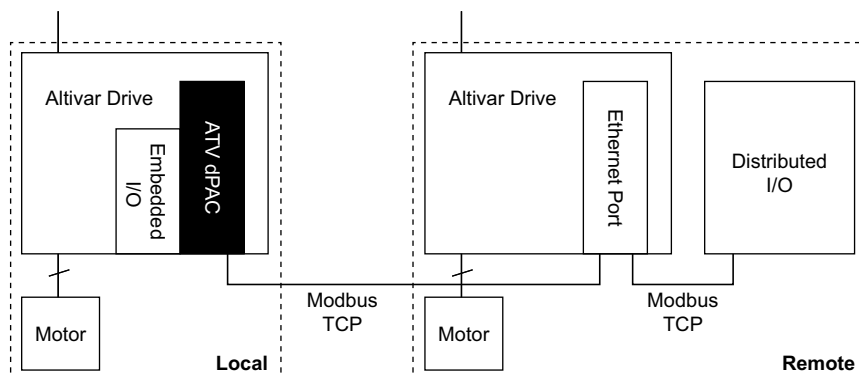
Maximum Hardware Configuration

Introduction

The ATV dPAC is a control system that offers a scalable solution with optimized configurations and an expandable architecture.

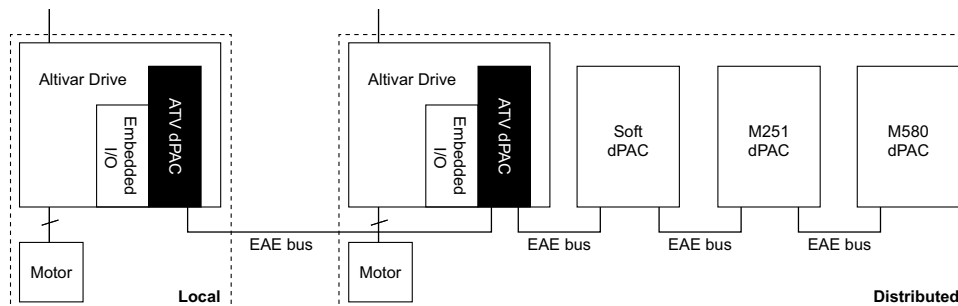
Local and Remote Configuration Principle

The following figure defines the local and remote configurations:



Local and Distributed Configuration Principle

The following figure defines the local and distributed configurations:



Local Configuration Architecture

Optimized local configuration and flexibility are provided by the association of the following:

- ATV dPAC,
- Variable Speed Drive (part controlling the motor),
- Inputs and outputs embedded to the drive.

NOTE: The following are supported from ATV dPAC software version **V3.11E03**:

- ATV340 embedded encoder (available on drives with power equal to or lower than 22 kW),
- VW3A3420, VW3A3422, VW3A3423 and VW3A3424 option encoder interface modules (digital, analog, resolver and HTL),
- VW3A3203 extended I/O module,
- VW3A3204 extended relay module.

Application requirements determine the architecture of your ATV dPAC configuration.

Remote Configuration Architecture

Optimized remote configuration and flexibility are provided, through Modbus TCP connection by the association of the following:

- ATV dPAC (acting as client over Modbus TCP),
- Other Altivar drives via Ethernet port (acting as Modbus TCP server)
- Distributed I/O such as Advantys STB Digital I/O modules or TM3 Bus Coupler for I/O modules. They are managed by ATV dPAC
- Modbus TCP Server
- OPC Unified Architecture Server (OPC UA Server) to be interfaced with SCADA Systems
- Other Modbus TCP server devices.

Application requirements determine the architecture of your ATV dPAC configuration.

Distributed Configuration Architecture

Optimized distributed configuration and flexibility are provided, through EcoStruxure Automation Expert bus connection, by the association of the following:

- ATV dPAC
- M251 dPAC
- M580 dPAC
- Soft dPAC (for example running on server).

Application requirements determine the architecture of your ATV dPAC configuration.

Maximum Number of Modules

The maximum configuration supported is:

- **Local:** the part of the drive controlling the motor and all embedded inputs/ outputs of the drive,
- **Remote:** up to 13 Modbus TCP server devices,
- **Distributed:** up to 16 (ATV dPAC, M251 dPAC, M580 dPAC or soft dPAC).

NOTE: The following are supported from ATV dPAC software version **V3.1IE03:**

- ATV340 embedded encoder (available on drives with power equal to or lower than 22 kW),
- VW3A3420, VW3A3422, VW3A3423 and VW3A3424 option encoder interface modules (digital, analog, resolver and HTL),
- VW3A3203 extended I/O module,
- VW3A3204 extended relay module.

NOTE: Maximum configuration is based on activation of OPC UA services and varies with Bus Cycle Time, usage of EcoStruxure Automation Expert libraries, and other services. Use the light Hardware CAT for designing maximum configuration.

NOTE: The configuration with Altivar drives in remote architecture is done with SoMove using pre-configured .psx files (one for each drive family). For more information refer to SE.FieldDevice online help.

NOTE: In some environments, the maximum configuration populated by high consumption modules, coupled with the maximum distance allowable between the devices, may present bus communication errors although the EcoStruxure Automation Expert software allows for the configuration. In such a case you will need to analyze the power consumption of the modules chosen for your configuration, as well as the minimum cable distance required by your application, and possibly seek to optimize your choices.

Accessories

Overview

This section describes the accessories and cables.

Accessories

Reference	Description	Use	Quantity
VW3A1111	Graphic Display Terminal (VW3A1111)	Includes a battery to monitor time when power is off. NOTE: Graphic Display Terminal (VW3A1111) is not delivered with ATV340 and cabinet integration products (ATV600●●●●●Z, ATV900●●●●●Z).	1
VW3A1112	Remote Mounting Kit	To mount the Graphic Display Terminal (VW3A1111) on enclosure door. It requires a remote-mounting cord set.	1
VW3A1104R10 VW3A1104R30 VW3A1104R50 VW3A1104R100	Remote-mounting cord set (1 m, 3 m, 5 m, 10 m)	To wire the drive to the remote-mounting kit. It is equipped with 2 RJ45 connectors.	1
ZB5AZ905	Tightening tool	For remote mounting kit	1

For more information refer to the Altivar drive catalogs.

Cables

Reference	Description	Details	Length
490NTW000●●	Ethernet shielded cable for DTE connections	Standard cable, equipped with RJ45 connectors at each end for DTE. CE compliant.	2, 5, 12, 40, or 80 m (6.56, 16.4, 39.37, 131.23 or 262.5 ft)
490NTW000●●U		Standard cable, equipped with RJ45 connectors at each end for DTE. UL compliant.	2, 5, 12, 40, or 80 m (6.56, 16.4, 39.37, 131.23, or 262.5 ft)
TCSECE3M3M●●S4		Cable for harsh environment, equipped with RJ45 connectors at each end. CE compliant.	1, 2, 3, 5, or 10 m (3.28, 6.56, 9.84, 16.4, 32.81 ft)
TCSECU3M3M●●S4		Cable for harsh environment, equipped with RJ45 connectors at each end. UL compliant.	1, 2, 3, 5, or 10 m (3.28, 6.56, 9.84, 16.4, 32.81 ft)

ATV dPAC Features

Real Time Clock (RTC)

The ATV dPAC includes an RTC to provide system date and time information, and to support related functions requiring a real-time clock. To continue to monitor time when power is off, a non-rechargeable battery is required (see reference below).

This table shows how RTC drift is managed:

RTC Characteristics	Description
RTC drift	Less than 60 seconds per month without any user calibration at 25 °C (77 °F)

NOTE: It's mandatory to have a Graphic Display Terminal (VW3A1111) for ATV 340 to monitor the RTC when the power is off.

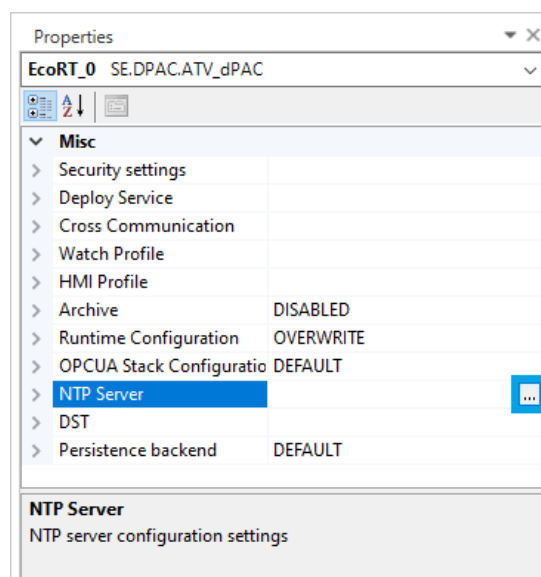
Network Time Protocol (NTP) Server Configuration in EcoStruxure Automation Expert

Overview

Use the NTP Server Configuration dialog to synchronize the selected device's clock to a time value provided by an NTP server

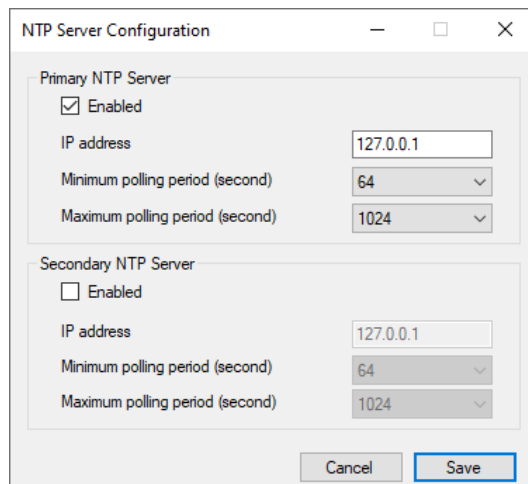
Procedure

1. Select a device in the Logical Devices editor in EcoStruxure Automation Expert
2. In the Properties pad click the ellipsis for the NTP Server node



3. A window will pop-out allowing you to configure the following parameters:

- A Primary NTP Server only
- Both a Primary NTP Server and a Secondary NTP Server



The image shows a 'NTP Server Configuration' dialog box. It has two sections: 'Primary NTP Server' and 'Secondary NTP Server'. The 'Primary NTP Server' section has a checked 'Enabled' checkbox, an 'IP address' field with '127.0.0.1', a 'Minimum polling period (second)' dropdown with '64', and a 'Maximum polling period (second)' dropdown with '1024'. The 'Secondary NTP Server' section has an unchecked 'Enabled' checkbox and the same IP address, polling period, and dropdown settings. At the bottom are 'Cancel' and 'Save' buttons.

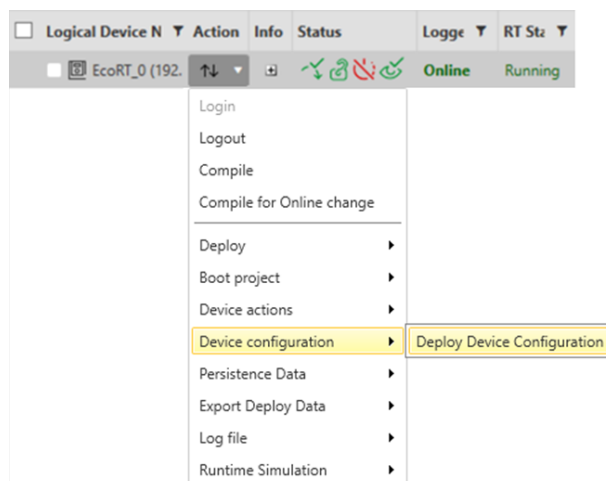
The table below explains these parameters:

Parameter	Description
Enabled	Activates polling by the device's NTP client to the NTP server.
IP address	The NTP server's IPv4 address.
Minimum polling period	The minimum time, in seconds, the device's NTP client waits to poll the NTP server.
Maximum polling period	The maximum time device's NTP client waits, in seconds, to poll the NTP server.

4. Set the IP address of your NTP server → Save the NTP server configuration

NOTE: The NTP server could be a PLC or a laptop...

5. Compile → Login to the device → Deploy → Run device actions → Deploy device configuration

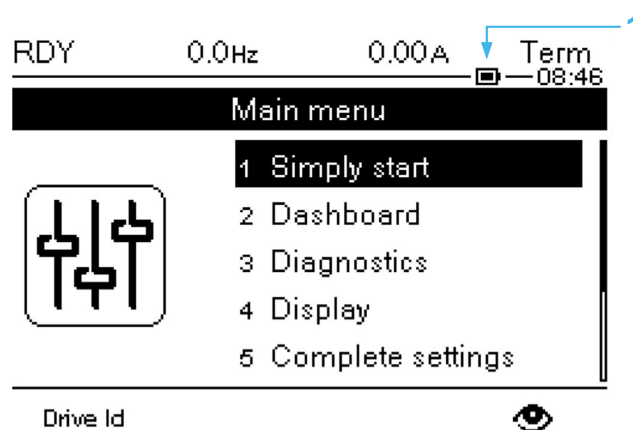


6. Power-cycle the device to apply the changes.

Battery

ATV dPAC controller uses a battery located in the Graphic Display Terminal (VW3A1111): the Graphic Display Terminal (VW3A1111) must remain connected to the Altivar drive.

A battery icon on the Graphic Display Terminal (VW3A1111) indicates if the battery is depleted or absent.



Legend:

1 Battery icon

The Graphic Display Terminal (VW3A1111) is not delivered with ATV340 drives and ATV600, ATV900 cabinet integration drives. It must be ordered separately.

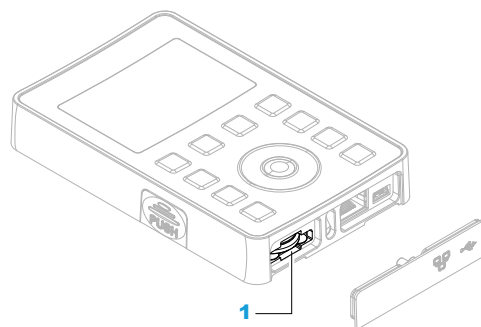
In the event of a power interruption, the backup battery maintains the RTC for the controller.

This table shows the characteristics of the battery:

Characteristics	Description
Use	In the event of a transient power outage, the battery powers the RTC.
Backup life	At least 2 years at 25 °C maximum (77 °F). At higher temperatures, the time is reduced
Battery monitoring	Yes
Replaceable	Yes
Controller battery type	Lithium coin cell, type Panasonic CR2032

Location of the Battery in the Graphic Display Terminal (VW3A1111)

The battery is located at the bottom of the Graphic Display Terminal (VW3A1111) (see 1 in the figure below):



Installing or Replacing the Battery

While lithium batteries are preferred due to their slow discharge and long life, they can present hazards to personnel, equipment and the environment and must be handled properly.

⚠ DANGER

EXPLOSION, FIRE OR CHEMICAL BURNS

- Replace with identical battery type
- Follow all the instructions of the battery manufacturer
- Remove all replaceable batteries before discarding unit
- Recycle or properly dispose of used batteries
- Protect battery from any potential short-circuit
- Do not recharge, disassemble, heat above 100 °C (212 °F), or incinerate
- Use your hands or insulated tools to remove or replace the battery
- Maintain proper polarity when inserting and connecting a new battery

Failure to follow these instructions will result in death or serious injury.

To install or replace the battery, follow these steps:

Battery Installation

Step	Action
1	Ensure that the power is off.
2	Remove the Graphic Display Terminal (VW3A1111) from the drive or the remove mounting kit.
3	Remove the strip at the bottom of the Graphic Display Terminal (VW3A1111)
4	Remove the battery from the battery holder
5	Insert the new battery into the battery holder in accordance with the polarity markings on the battery
6	Put back the strip at the bottom of the Graphic Display Terminal (VW3A1111)
7	Put back the Graphic Display Terminal (VW3A1111) at its previous location
8	Power on the drive (or at least the control part in case of separate supply mode).
9	Set the internal clock

ATV dPAC Installation

ATV dPAC General Information

Mechanical data

ATV dPAC weight: 0.15 kg

ATV dPAC dimensions: 41 x 109 x 23.25 mm (1.61 x 4.29 x 0.91 in)

Environmental characteristics

Refer to Schneider Electric website and/or to the Installation Manual of Altivar drives, page 9

Certifications and Standards

Refer to Schneider Electric website and/or to the Installation Manual of Altivar drives, page 9

Installation and Maintenance Requirements

Before Starting

Read and understand this chapter before beginning the installation of your system.

The use and application of the information contained herein require expertise in the design and programming of automated control systems. Only you, the user, machine builder or integrator, can be aware of all the conditions and factors present during installation and setup, operation, and maintenance of the machine or process, and can therefore determine the automation and associated equipment and the related safeties and interlocks which can be effectively and properly used. When selecting automation and control equipment, and any other related equipment or software, for a particular application, you must also consider any applicable local, regional or national standards and/or regulations.

Pay particular attention in conforming to any safety information, different electrical requirements, and normative standards that would apply to your machine or process in the use of this equipment.

Disconnecting Power

Ensure that the power is off before installing or uninstalling any option modules.

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

DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH

- Only appropriately trained persons who are familiar with and fully understand the contents of the present manual and all other pertinent product documentation and who have received all necessary training to recognize and avoid hazards involved are authorized to work on and with this drive system.
- Installation, adjustment, repair and maintenance must be performed by qualified personnel.
- Verify compliance with all local and national electrical code requirements as well as all other applicable regulations with respect to grounding of all equipment.
- Only use properly rated, electrically insulated tools and measuring equipment.
- Do not touch unshielded components or terminals with voltage present.
- Prior to performing any type of work on the drive system, block the motor shaft to prevent rotation.
- Insulate both ends of unused conductors of the motor cable.
- Do not short across the DC bus terminals or the DC bus capacitors or the braking resistor terminals.

Failure to follow these instructions will result in death or serious injury.

DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Before performing work on the drive system:

- Disconnect all power, including external control power that may be present. Take into account that the circuit breaker or main switch does not de-energize all circuits.
- Place a "Do Not Turn On" label on all power switches related to the drive system.
- Lock all power switches in the open position.
- Wait 15 minutes to allow the DC bus capacitors to discharge.
- Verify the absence of voltage. (1)

Before applying voltage to the drive system:

- Verify that the work has been completed and that the entire installation cannot cause hazards.
- If the mains input terminals and the motor output terminals have been grounded and short-circuited, remove the ground and the short circuits on the mains input terminals and the motor output terminals.
- Verify proper grounding of all equipment.
- Verify that all protective equipment such as covers, doors, grids is installed and/or closed.

Failure to follow these instructions will result in death or serious injury.

Refer to the installation manual of the product. See [Related Documents.](#), page 9

Programming Considerations

⚠ WARNING

UNANTICIPATED EQUIPMENT OPERATION

- Only use software approved by Schneider Electric for use with this equipment.
- Update your application program every time you change the physical Hardware configuration.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Operating Environment

In addition to the **Environmental Characteristics**, refer to **Product Related Information** in the beginning of the present document for important information regarding installation in hazardous locations for this specific equipment.

⚠ WARNING

UNANTICIPATED EQUIPMENT OPERATION

Install and operate this equipment according to the conditions described in the Environmental Characteristics.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Installation Considerations

⚠ WARNING

UNANTICIPATED EQUIPMENT OPERATION

- Use appropriate safety interlocks where personnel and/or equipment hazards exist.
- Install and operate this equipment in an enclosure appropriately rated for its intended environment and secured by a keyed or tooled locking mechanism.
- Use the sensor and actuator power supplies only for supplying power to the sensors or actuators connected to the module.
- Power line and output circuits must be wired and fused in compliance with local and national regulatory requirements for the rated current and voltage of the particular equipment.
- Do not use this equipment in safety-critical machine functions unless the equipment is otherwise designated as functional safety equipment and conforming to applicable regulations and standards.
- Do not disassemble, repair, or modify this equipment
- Do not connect any wiring to reserved, unused connections, or to connections designated as No Connection (N.C.).

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Installation of the ATV dPAC

Before Starting

Verify that the module catalog number marked on the label is the same as that on the delivery note corresponding to the purchase order.

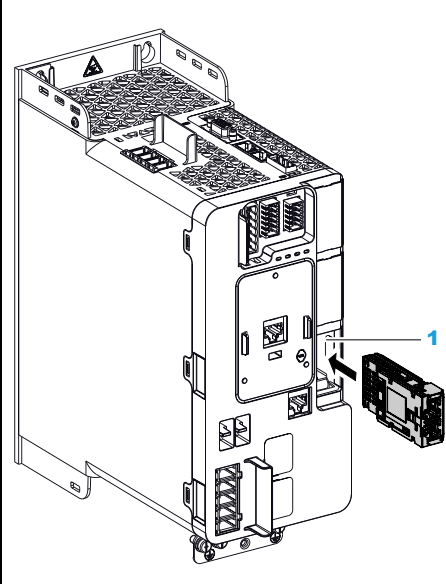
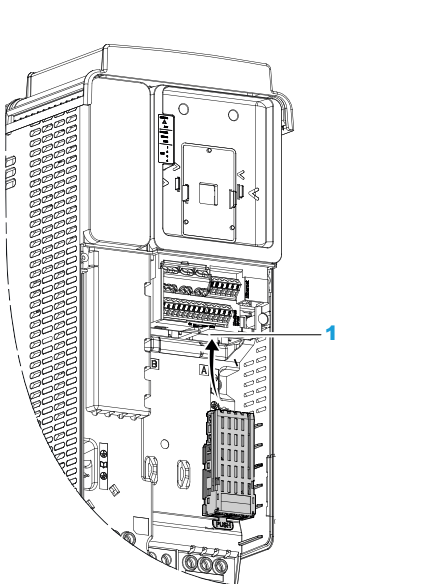
Remove the ATV dPAC module from its packaging and verify that it has not been damaged in transit.

Verify that the ATV dPAC is compatible with the drive firmware version. Refer to [Firmware Version Compatibility](#), page 13.

Insertion of the ATV dPAC

The table provides the procedure for insertion of the ATV dPAC in the drive:

Step	Action
1	Ensure that the power is off.
2	Locate the module slot A on the bottom of the control part (or GP-FB on ATV340 with power equal to or lower than 22kW).
3	Insert the ATV dPAC in the corresponding slot.
4	Add the corresponding sticker on the LED front panel of the drive. NOTE: There is not sticker for ATV340 with power equal to or lower than 22kW. In this case, the used LEDs are located on the module itself
5	Verify that the module is correctly inserted and locked mechanically in the drive.

ATV340 (power $\leq$ 22 kW)	ATV340 (power > 22 kW), ATV600 and ATV900
	
1: GP-FB Slot	1: Module slot A

Removal of the ATV dPAC

The table provides the procedure for removal of the ATV dPAC option module from the drive:

Step	Action
1	Ensure that the power is off.
2	Press the strip.
3	Remove the module while maintaining the strip pressed,

Additional information

For more information on the installation refer to the Instruction Sheet S1A45591 provided with the ATV dPAC or on www.se.com

Electrical requirements

Wiring best practices

ATV dPAC is inserted inside Altivar drive. For the wiring related to the drive, refer to the section Drive Wiring available inside the installation of the drive (See Related Documents, page 9)

This paragraph describes the wiring guidelines and associated best practices to be respected when using the ATV dPAC system.

DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH

- Disconnect all power from all equipment including connected devices prior to removing any covers or doors, or installing or removing any accessories, hardware, cables, or wires except under the specific conditions specified in the appropriate hardware guide for this equipment.
- Always use a properly rated voltage sensing device to confirm the power is off where and when indicated.
- Replace and secure all covers, accessories, hardware, cables, and wires and confirm that a proper ground connection exists before applying power to the unit.
- Use only the specified voltage when operating this equipment and any associated products.

Failure to follow these instructions will result in death or serious injury.

⚠ WARNING

LOSS OF CONTROL

- The designer of any control scheme must consider the potential failure modes of control paths and, for certain critical control functions, provide a means to achieve a safe state during and after a path failure. Examples of critical control functions are emergency stop and overtravel stop, power outage and restart
- Separate or redundant control paths must be provided for critical control functions.
- System control paths may include communication links. Consideration must be given to the implications of unanticipated transmission delays or failures of the link.
- Observe all accident prevention regulations and local safety guidelines.¹
- Each implementation of this equipment must be individually and thoroughly tested for proper operation before being placed into service.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

NOTE: For additional information, refer to NEMA ICS 1.1 (latest edition), "Safety Guidelines for the Application, Installation, and Maintenance of Solid State Control" and to NEMA ICS 7.1 (latest edition), "Safety Standards for Construction and Guide for Selection, Installation and Operation of Adjustable-Speed Drive Systems" or their equivalent governing your particular location.

These requirements must be applied when wiring an ATV dPAC system:

- Communication wiring must be kept separate from the power wiring. Route these 2 types of wiring in separate cable ducting.
- Verify that the operating conditions and environment are within the specification values.
- Use twisted pair, shielded cables for networks, and fieldbus.

Use shielded, properly grounded cables for all communication connections. If you do not use shielded cable for these connections, electromagnetic interference can cause signal degradation. Degraded signals can cause the controller or attached modules and equipment to perform in an unintended manner.

⚠ WARNING

UNANTICIPATED EQUIPMENT OPERATION

- Use shielded cables for all communication signals.
- Ground cable shields for all communication signals at a single point.
- Route communication separately from power cables.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

NOTE: Multipoint grounding is permissible if connections are made to an equipotential ground plane dimensioned to help avoid cable shield damage in the event of power system short-circuit currents.

For more details, refer to [Grounding Shielded Cables](#), page 33.

NOTE: Surface temperatures may exceed 60 °C (140 °F).

To conform to IEC 61010 standards, route primary wiring (wires connected to power mains) separately and apart from secondary wiring (extra low voltage wiring coming from intervening power sources). If that is not possible, double insulation is required such as conduit or cable gains.

DC Power supply characteristics & wiring

The power supply of the ATV dPAC is provided by the host Altivar drive. For the characteristics and wiring related to the power supply of the drive, refer to the installation manual of the drive (See [Related Documents](#), page 9).

Depending on the drive wiring, there are two different modes to energize the ATV dPAC:

- With the drive powered by the power supply stage,
- With Separate Control Stage of the Drive. The control part and the power part of the drive are separated. The external control power supply must meet the requirements given in the installation manual of the drive.

⚠⚠ DANGER

ELECTRIC SHOCK CAUSED BY INCORRECT POWER SUPPLY UNIT

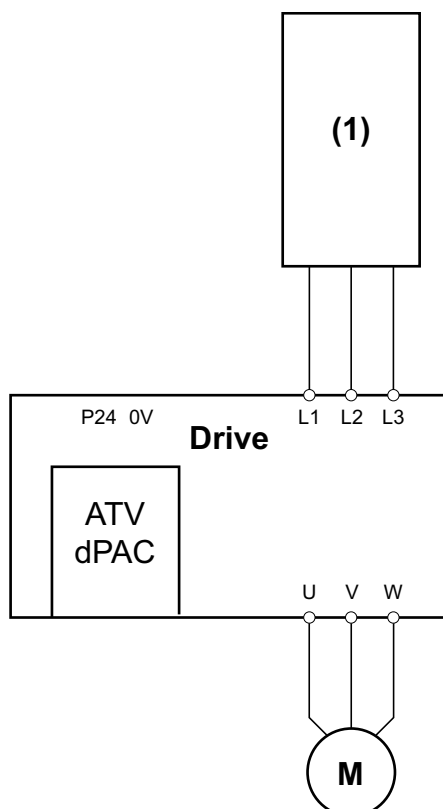
The +24VDC supply voltage is connected with many exposed signal connections in the drive system.

- Use a power supply unit that meets the PELV (Protective Extra Low Voltage) requirements.

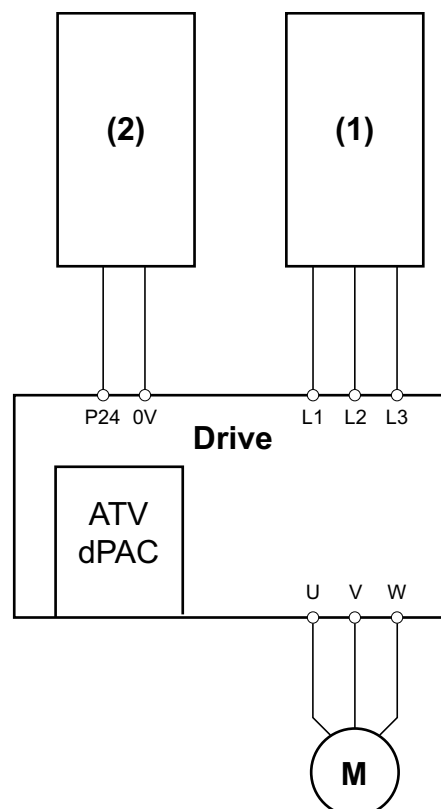
Failure to follow these instructions will result in death or serious injury.

DC Power Supply Wiring

Power Stage Supply



Separate Control Stage



Legend: (1) Power — (2) Control

Power interruption

With separate control stage, the duration of power interruptions where the ATV dPAC is able to continue normal operation varies depending upon the load on the outputs of the drive and the presence of option module, it can be shorter than 1 ms. With power stage supply, the duration of power interruptions where the ATV dPAC is able to continue normal operation varies but a minimum of 10 ms is maintained as specified by IEC standards. To sustain longer power interruption, it is advisable to use power stage supply.

When planning the management of the power supplied to the controller, you must consider the power interruption duration due to the fast cycle time of the controller.

There could potentially be many scans of the logic and consequential updates to the I/O image table during the power interruption, while there is no external power supplied to the inputs, the outputs or both depending on the power system architecture and power interruption circumstances.

⚠ WARNING

UNANTICIPATED EQUIPMENT OPERATION

- Individually monitor each source of power used in the controller system including input power supplies, output power supplies and the power supply to the controller to allow appropriate system shutdown during power system interruptions.
- The inputs monitoring each of the power supply sources must be unfiltered inputs.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Grounding the ATV dPAC system

ATV dPAC is inserted inside Altivar drive. For the grounding related to the drive, refer to the installation of the drive (See Related Documents, page 9).

Regarding the ATV dPAC, the following requirements must be applied.

⚠ WARNING

UNANTICIPATED EQUIPMENT OPERATION
--

- | |
|--|
| <ul style="list-style-type: none">• Use shielded cables for all digital and analog I/O signals and communication signals.• Ground cable shields at a single point.• Route communication cables and I/O cables separately from power cables |
|--|

Failure to follow these instructions can result in death, serious injury, or equipment damage.
--

1 Multi-point grounding is permissible if connections are made to an equi-potential ground plane dimensioned to help avoid cable shield damage in the event of power system short-circuit currents

ATV dPAC Communication

Ethernet Port

Overview

The ATV dPAC is equipped with one dual Ethernet port switch.

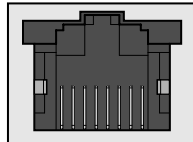
Characteristics

This table describes the different Ethernet characteristics:

Characteristic	Description
Function	Modbus TCP/IP protocol
Connector type	RJ45
Auto negotiation	From 10 M half duplex to 100 M full duplex
Cable type	Shielded
Automatic cross-over detection	Yes

Pin assignment

This figure shows the RJ45 Ethernet connector pin assignment:



8 7 6 5 4 3 2 1

This table describes the RJ45 Ethernet connector pins:

Pin N	Signal
1	TD+
2	TD-
3	RD+
4	NA
5	NA
6	RD-
7	NA
8	NA

Connecting the ATV dPAC to a PC

Connecting the Controller to a PC

Overview

To transfer, run, and monitor the applications, connect the ATV dPAC to a PC, that has EcoStruxure Automation Expert installed, using an Ethernet connection.

NOTICE

INOPERABLE EQUIPMENT

Always connect the communication cable to the PC before connecting it to the controller.

Failure to follow these instructions can result in equipment damage.

The default IP address is 0.0.0.0 for both Ethernet ports.

The default mask is 0.0.0.0.

Ethernet Port Connection

If there is a need for a firmware update, perform the following actions to connect the controller to the PC

Step	Action
1	Connect the Ethernet cable to the PC.
2	Connect the Ethernet cable to either one of the Ethernet ports on the ATV dPAC.
3	Perform DPWS discovery (IPv6 connection) to connect from EcoStruxure Automation Device Maintenance.
4	Login and update the firmware, set the IPv4 address you need with EcoStruxure Automation Device Maintenance.
5	Use IPv4 address to connect from EcoStruxure Automation Expert.

If the firmware is up to date, perform the following actions:

Step	Action
1	Connect the Ethernet cable to the PC.
2	Connect the Ethernet cable to either one of the Ethernet ports on the ATV dPAC.
3	Add the ATV drive and ATV dPAC under Physical Topology in EcoStruxure Automation Expert , then configure the IP address using properties tab of ATV dPAC.
4	Start the system monitoring and configure security using default credentials. Login - installer Password - Inst@ller1 NOTE: Use the Graphic Display Terminal (VW3A1111) to enable security for the ATV drive and the ATV dPAC
5	Login and Deploy the EcoStruxure Automation Expert solution.
NOTE: It is also possible to set the IPv4 address with EcoStruxure Automation Expert .	

Local reset of the ATV dPAC security

Overview

If the device password has been forgotten, the user can reset the security of the ATV dPAC, using the drive's Graphic Display Terminal (VW3A1111).

Prerequisites

- Update the firmware package of:
 - The Drive (Refer to the [Getting Started with ATV dPAC VW3A3530D](#) for more details on this step)
 - The ATV dPAC (Refer to the [Getting Started with ATV dPAC VW3A3530D](#) for more details on this step)

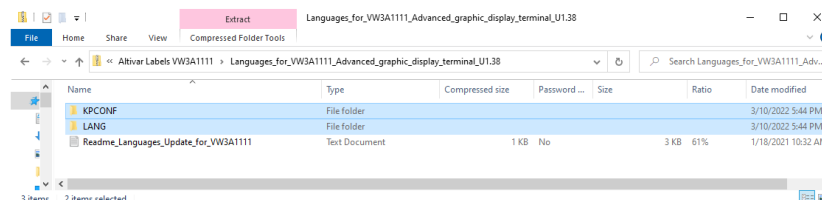
NOTE: The table below shows the firmware versions that allows this feature (Local reset ATV dPAC security).

Device	ATV6xx	ATV9xx	ATV340	ATV dPAC
Firmware Version greater than	V3.7IE94_B02	V3.8IE94_B02	V3.6IE94_B02	V3.1IE08_B02

- Copy and paste the contents of the Language file (KPCONF and Lang Files) to the root of the Graphic Display Terminal (VW3A1111), via an USB cable to connect your Graphic Display Terminal (VW3A1111) to the laptop containing the language file.

NOTE: The language file :

- Can be found using the **EcoStruxure Automation Expert software installer archive** It exists on the following location: **EcoStruxure Automation Expert software installer archive > Firmware > Prod > SEDP_ATVD_*.zip > SEDP_ATVD_* > Altivar Labels VW3A1111 > Languages_for_VW3A1111_Advanced_graphic_display_terminal_*.zip**



- Can be downloaded here: [Languages_for_VW3A1111_Advanced_graphic_display_terminal](#)

Procedure

1. **Local reset on the Graphic Display Terminal (VW3A1111)** by following these steps: **[Main menu] > [Communication] > [Comm parameters] > [DPAC] > set [DRSO] to Yes > click the OK button to accept the warning message > power cycle the drive**

NOTE: At the point, the application keeps running (security is not yet changed/reset).

NOTE: The user would need to take the appropriate steps to stop the application, and power-down the drive.

⚠ WARNING

UNAUTHENTICATED ACCESS AND PROCESS OPERATION

Setting [DRSO] to YES, default credentials will allow access to the ATV dPAC, at the next device Power-up.

Do not set [DRSO] to YES if your machine or process is accessible to unauthorized personnel either directly or via a network.

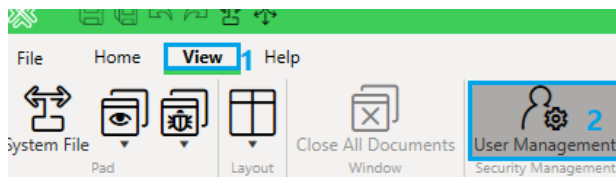
Power-cycle the device, and re-configure security to run the application.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

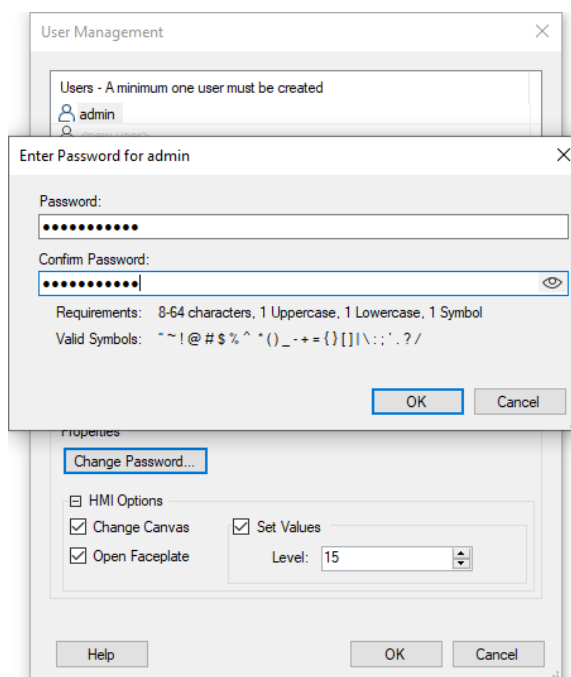
2. Reset the password of your existing solution in EcoStruxure Automation Expert:

NOTE: this step will only be needed if you have forgotten the password of your existing solution, if this is not the case create a new one with your chosen credentials and skip this step.

a. click on View window > click on User Management



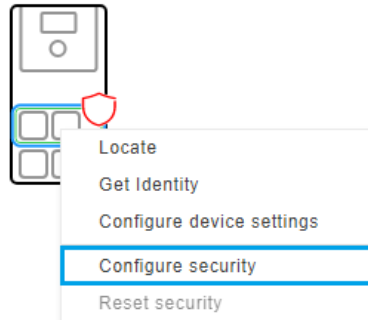
b. Click on the existing username > check the boxes of HMI options and set the level on 15 as shown in the figure below > click on change password > set the new password of the solution



3. Configure the security of your existing solution in EcoStruxure Automation Expert :

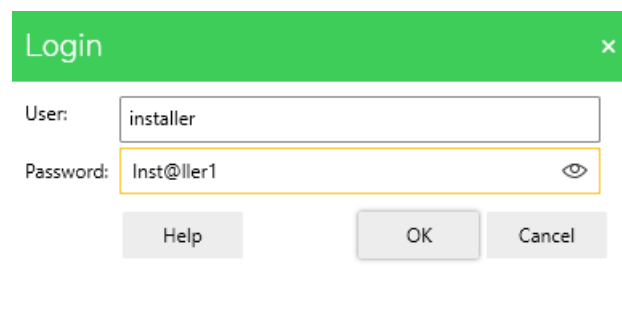
- a. Open the system tab 
- b. Go to Physical devices 
- c. Start monitoring 
- d. Right click on the ATV dPAC device to configure the security

ATVdPAC_...: 192.168.1.21
ATV9_1



NOTE: Disable the firewall if it does not allow you to configure the security.

- e. Use the default credentials to login



NOTE: The default credentials are:

- User: installer
- Password: Inst@ller1

4. Open the Deploy and Diagnostic editor, do the following:

- Compile the solution
- Login using the EcoStruxure Automation Expert user management credentials.
- Deploy the solution
- Run device actions

You can now start the local HMI using the EcoStruxure Automation Expert user management credentials.

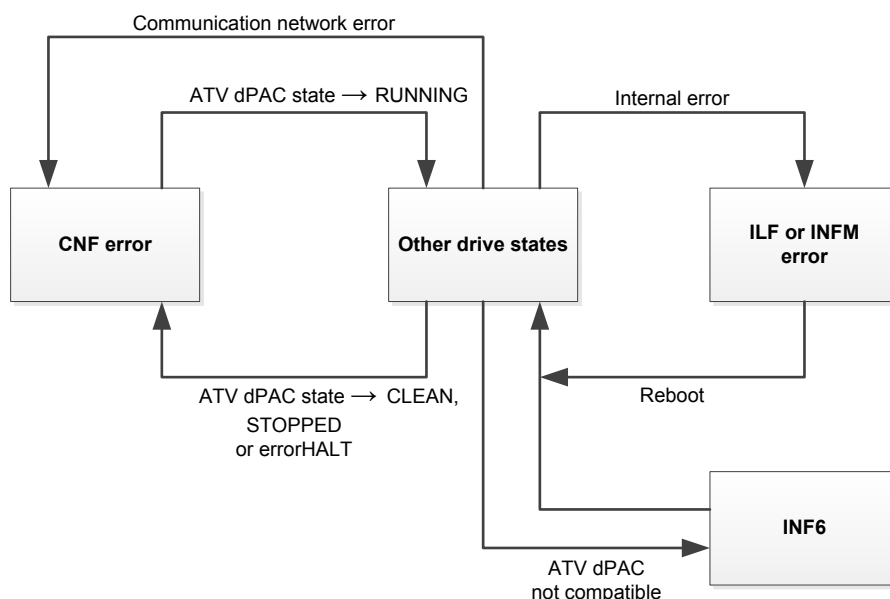
Controller States and Behaviors

ATV dPAC Specific Behavior

Introduction

This chapter describes the specific behavior related to the ATV dPAC operating modes. The part common to EcoStruxure Automation Expert controller offer is described in the 'Operating Modes' chapter in the EcoStruxure™ Automation Expert Reference Guide.

Drive Operating State and ATV dPAC Operating States



The drive operating mode machine is different from the ATV dPAC operating mode machine. With ATV dPAC, the drive continues to follow its operating state machine.

- The drive remains in Operating State Fault **[Fieldbus Com Interrupt] L n F** if ATV dPAC is in the operating mode CLEAN, STOPPED or errorHALT. The drive switches from this state when ATV dPAC is in operating mode RUNNING.
- If a communication network error is detected by the ATV dPAC, ATV dPAC switches to errorHALT operating mode and **[Fieldbus Com Interrupt] L n F** is triggered by the drive.
NOTE: The drive response to a **[Fieldbus Com Interrupt] L n F** error can be configured via the parameter **[Fieldbus Interrupt Resp] L L L**.
- If an internal error is detected, **[Internal Link Error] L F** or **[Internal Error 22] L n F** is triggered by the drive depending on the error.
- In case of **[Internal Error 6] L n F**, the ATV dPAC is not supported by the firmware of the drive. Verify the version compatibility.

For more information on the drive errors, refer to the drive Programming Manual, page 9.

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As standards, specifications, and design change from time to time,
please ask for confirmation of the information given in this publication.

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