Material Working

User Guide for Drilling Machine Project Template

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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. If you have any suggestions for improvements or amendments or have found errors in this publication, please notify us.

All pertinent state, regional, and local safety regulations must be observed when installing and using this product. For reasons of safety and to help ensure compliance with documented system data, only the manufacturer should perform repairs to components.

When devices are used for applications with technical safety requirements, the relevant instructions must be followed.

Failure to use Schneider Electric software or approved software with our hardware products may result in injury, harm, or improper operating results.

Failure to observe this information can result in injury or equipment damage.

Table of Contents

Safety Information

Important Information

NOTICE

Read these instructions carefully, and look at the equipment to become familiar with the device before trying to install, operate, 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 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 an imminently hazardous situation which, if not avoided, **will result in** death or serious injury.

⚠ WARNING

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

⚠ CAUTION

CAUTION indicates a potentially hazardous situation which, if not avoided, **can 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.

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.

⚠ CAUTION

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 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.

About the Book

At a Glance

Document Scope

This document describes the project template based on Modicon M241 Logic Controller and an HMI STU 855 display for drilling application.

The following basic knowledge is required:

- Basic information on functionality, structure, and configuration of the controllers, drives, and HMI displays.
- Programming in Structured Text (ST) and Continuous Function Chart (CFC).

Validity Note

This document has been created with SoMachine V4.1.

Related Documents

Title of Document	Reference Number
SoMachine Installation and Configuration Manager User Guide	EIO0000001722
SoMachine Central User Guide	EIO0000001660
SoMachine Programming Guide	EIO0000000069
SoMachine EEToolbox Library Guide	EIO0000001157
SoMachine ModbusEE Toolbox Library Guide	EIO0000001224
SoMachine MED Library Guide	EIO0000001163
LXM32A, AC servo drive, Product Manual	0198441113755, V1.07

You can download these technical publications and other technical information from our website at www.schneider-electric.com

Product Related Information

⚠ 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.

[1] 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.

⚠ WARNING

UNINTENDED 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.

Chapter 1
Drilling Machine Application Template

Introduction

The project template is an application example for controlling a drilling machine. It contains a hardware configuration for a drilling machine with 4 axes and programs for controlling feeder conveyor, drilling motor, horizontal and vertical movement. It also contains a CANopen configuration for various drives. You can parameterize and control through HMI. A PC with SoMachine software installed is necessary to download this project template to a M241 Logic Controller and the HMI.

This project template is developed for an M241 Logic Controller with an HMIS5T (HMIS65/S85).

NOTE: You can also use this project template with other controllers and HMIs after necessary adaptations.

Chapter 2
Drilling Machine Architecture

Overview

This chapter describes the drilling machine architecture.

What Is in This Chapter?

This chapter contains the following topics:

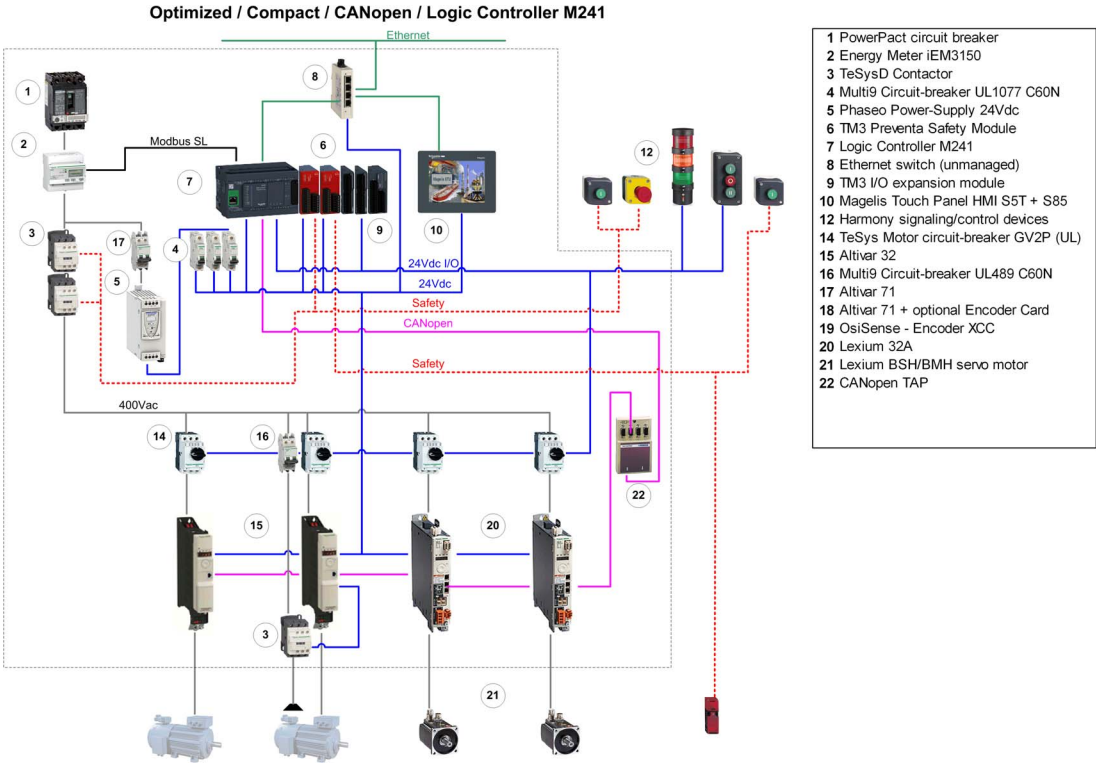
Hardware Architecture

Overview

The following figure shows a supported hardware architecture of a drilling machine. Altivar 32 is prescribed for drilling axis and feeder conveyor. Lexium 32A is prescribed for horizontal and vertical movement.

Used Architecture

The following figure shows the used architecture:



Material Working Application System Requirements

Using the Library

⚠ WARNING

UNINTENDED EQUIPMENT OPERATION

- Verify the SoMachine libraries contained in your program are the correct version after updating SoMachine software.
- Verify that the library versions updated are consistent with your application specifications.

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

For more detailed information, see Schneider Electric Libraries *(see SoMachine, Functions and Libraries User Guide)*.

For IEC 61131-3 compatibility, the ability to add the EN/ENO input/output automatically to Function Blocks of certain programming languages is available to the programmer. However, for certain applications that require the complex interaction of multiple function blocks, the use of the IEC 61131-3 input to disable a function block in a series of interrelated functions affecting a process may lead to unintended operation of the system as a whole. For the functions contained in the Library that is the topic of the current document, this is especially true.

The EN/ENO inputs and outputs as defined by IEC 61131-3 are maladapted to, and therefore inappropriate for, the targeted application of these functions. Suddenly disabling one function by a falling edge on the EN input would require all outputs of the function block to immediately fall to their default states, and such an unanticipated action would cause in abrupt change to the entire process. The implication is that such an event would have deleterious results that may invoke undesirable consequences. Therefore, the EN/ENO inputs/outputs as defined by IEC 61131-3 are incompatible with the functions contained within this library.

⚠ WARNING

UNINTENDED MACHINE OPERATION

Do not use the EN/ENO functionality defined by IEC 61131-3 to control the behavior of the Application Function blocks.

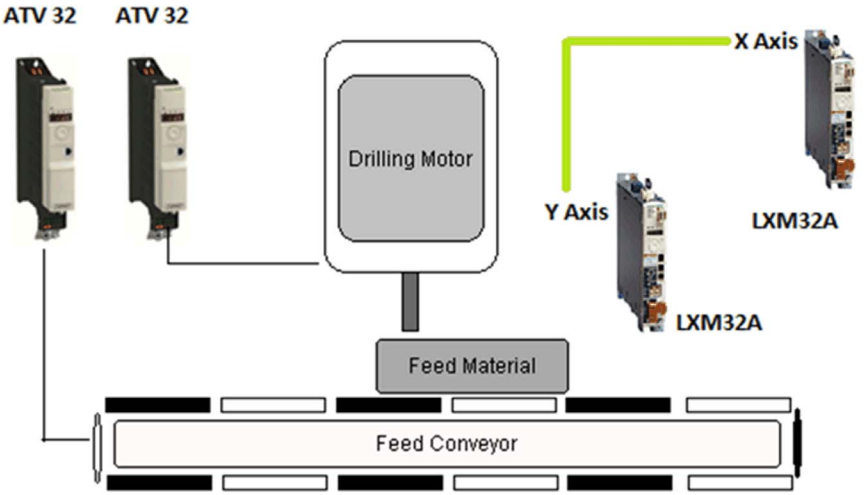
Failure to follow these instructions can result in death, serious injury, or equipment damage.

NOTE: Verify that the EN/ENO option is disabled in the complier options menu of SoMachine.

System Requirements

The application requires servo drives for the horizontal and vertical movement controlled by PLCopen function blocks. Also, the ATV PLCopen function blocks are used to control the feeder conveyor and drilling motor drive over CANopen. The M241 Logic Controller is connected to the HMI through Ethernet.

The following figure shows a drilling machine:



Chapter 3
Hardware Configuration

Embedded IOs

Overview

The inputs and outputs of the M241 are used to monitor the status and control of the drilling machine.

Input Variables

This table describes the input variable:

Input	Variable	Description
–	`xEmergency1`	Emergency E-Stop
–	`xEmergency2`	Emergency door main
–	`xFeedSensor`	Material detection sensor at the input section of the conveyor
–	`xMcbRdyLxmH`	Horizontal axis Motor circuit breaker (MCB): ● TRUE: Ok ● FALSE: Not Ok
–	`xMcbRdyLxmV`	Vertical axis Motor circuit breaker (MCB): ● TRUE: Ok ● FALSE: Not Ok
–	`xMcbRdyAtvConv`	Conveyor axis Motor circuit breaker (MCB): ● TRUE: Ok ● FALSE: Not Ok
–	`xMcbRdyAtvDril`	Drilling axis Motor circuit breaker (MCB): ● TRUE: Ok ● FALSE: Not Ok

Output Variables

This table describes the output variable:

Output	Variable	Description
–	`xOrange`	Manual mode
–	`xRed`	Detected alarm
–	`xGreen`	Auto mode
–	`xClampFeed`	Activate clamping device
–	`xBrkRelVerMtr`	Brake release for vertical axis

NOTE: In the existing project template, the inputs are simulated in the application and no physical inputs are wired to the embedded I/O. Based on the field inputs and outputs, it must be mapped to the respective controller I/O.

Chapter 4
Communication

Overview

The M241 drilling machine project template uses the following three communication interfaces:

- The CANopen field bus connects the Modicon M241 Logic Controller to Altivar 32 variable speed drives and Lexium 32 servo drives.
- The M241 and the Magelis HMIS5T (HMIS65/S85) communicate through Ethernet.
- The communication between M241 and the power meter is Modbus Serial Line.

The download of the application to the M241 and to the HMI is done using a single connection.

What Is in This Chapter?

This chapter contains the following topics:

Ethernet

Overview

The Modicon M241 Logic Controller is configured with a fixed IP address 192.168.100.20 and subnet mask 255.255.255.0.

The HMI is configured with a fixed IP address 192.168.100.10 and subnet mask 255.255.255.0.

Modbus Serial Line

Overview

The Modbus Serial Line RS-485 2-wire network is used for the communication between the M241 controller (master) and the power meter IEM3150 (slave).

The below table describes the Modbus parameters:

Parameter	Value
Baud rate	19200
Parity	Even-8-1
Address	44

CANopen

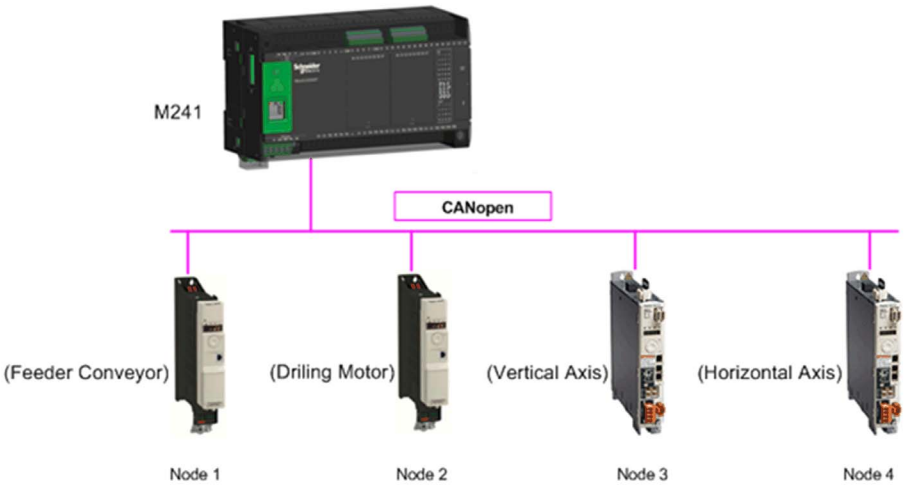
Overview

CANopen is used for communication with Altivar variable speed drives and Lexium servo drives. The configuration contains two Altivar 32 for feeder conveyor and drilling motor and two Lexium 32A servo drives for horizontal and vertical axes.

The drives have pre-defined node IDs that must be correctly configured. For example, Altivar 32 used on feeder conveyor axis must be configured with node ID 1.

This configuration is necessary for compatibility with various drives without changes in the project template.

The following figure shows supported drive configurations:



- Each of the 4 pre-configured drives has a pre-defined node ID.
- Baud rate of CANopen bus is configured to 500 kb/s.
- PDOs are configured with objects used in the application.
- The drives are set to produce Heartbeat object with producer time of 200 ms.

Chapter 5
Drive Configuration

Overview

The tables of parameters in this section describe a subset of parameters required for the best performance and operation of the project template. For more information concerning the configuration of Altivar variable speed drives and Lexium servo drives, refer to the documentation of the devices.

⚠ WARNING

UNGUARDED MACHINERY CAN CAUSE SERIOUS INJURY

- 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.

NOTE: You must configure drives according to the machine and specific application conditions and circumstances.

What Is in This Chapter?

This chapter contains the following topics:

Drives for Horizontal Axis

Overview

The drive for horizontal axis is configured as follows:

Set the drive to factory settings.

Configuration Parameters - Lexium 32

This table describes the configuration of the parameters specific to the horizontal axis:

Lexium 32 - Horizontal Axis			
Name	**Function**	**Value**	**Type**
`ScalePOSnum`	Position scaling - numerator 1	1	Mandatory
`ScalePOSdenom`	Position scaling - denominator	16384	
`Cobd`	Transmission speed	500	
`CoAd`	CANopen communication address setting	04	
`ScaleVELdenom`	Scaling velocity - denominator	01	
`ScaleVELnum`	Scaling velocity - numerator	01	

Drives for Vertical Axis

Overview

The drive for vertical axis is configured as follows:

Set the drive to factory settings.

Configuration Parameters - Lexium 32

This table describes the configuration of the parameters specific to the vertical axis:

Lexium 32 - Vertical Axis			
Name	**Function**	**Value**	**Type**
ScalePOSnum	Position scaling - numerator 1	1	Mandatory
ScalePOSdenom	Position scaling - denominator	16384	
Cobd	Transmission speed	500	
CoAd	CANopen communication address setting	03	
ScaleVELdenom	Scaling velocity - denominator	01	
ScaleVELnum	Scaling velocity - numerator	01	

Drives for Feeder Conveyor

Overview

The drive for feeder conveyor is configured as follows:

- Set the drive to factory settings.
- Set correct motor parameters.

Configuration Parameters - Altivar 32

This table describes the configuration of the parameters specific to the feeder conveyor drive:

Altivar 32 - Feeder Conveyor				
Menu	**Submenu**	**Parameter**	**Value**	**Type**
CONF - Full	Command	Reference 1 Channel (Fr1)	CAN	Mandatory
		Command Channel 1 (Cd1)	CAN	
		Reference 2 Channel (Fr2)	Fr1	
		Reference 2 Channel (rFC)	No	
	Communication	CANopen address (CnO - AdCO)	01	
		CANopen address (CnO - bdCO)	500	
	Simply start	Standard motor frequency (bFr)	*	
		Rated motor power (nPr)		
		Rated motor voltage (UnS)		
		Rated motor current (nCr)		
		Rated motor frequency (FrS)		
		Rated motor speed (nSP)		
(*) The information from the connected motor must be parameterized.				

Drives for Drilling Motor

Overview

The drive for drilling motor is configured as follows:

- Set the drive to factory settings.
- Set correct motor parameters.

Configuration Parameters - Altivar 32

This table describes the configuration of the parameters specific to the drilling motor drive:

Altivar 32 -Drilling Motor Drive				
Menu	**Submenu**	**Parameter**	**Value**	**Type**
CONF - Full	Command	Reference 1 Channel (Fr1)	CAn	Mandatory
		Command Channel 1 (Cd1)	CAn	
		Reference 2 Channel (Fr2)	Fr1	
		Reference 2 Channel (rFC)	No	
	Communication	CANopen address (CnO - AdCO)	02	
		CANopen address (CnO - bdCO)	500	
	Simply start	Standard motor frequency (bFr)	*	
		Rated motor power (nPr)		
		Rated motor voltage (UnS)		
		Rated motor current (nCr)		
		Rated motor frequency (FrS)		
		Rated motor speed (nSP)		
(*) The information from the connected motor must be parameterized.				

Chapter 6
Application Software

Overview

This chapter describes the application software.

What Is in This Chapter?

This chapter contains the following sections:

Section 6.1
Library Manager

Library Manager

Overview

The necessary libraries are configured in the project template.

The Energy Efficiency libraries are manually added to the project template.

Section 6.2
Task Configuration

Task Configuration

Overview

Task	POU	Type	Description
MAST	Prg_StateMachineDrilling	Cyclic	Contains the drilling application POUs. It is a parent task for CANopen communication. Runs with defined cycle time
	Prg_iEM3150_MdbSL		Contains the Energy Efficiency application POUs.

Section 6.3
Global Variables

Global Variables

Overview

The object global variable lists (GVL) contain global variables used for monitoring the system status and parameterization of the project template application. It is used for communication with the HMI.

Section 6.4
Drilling Control

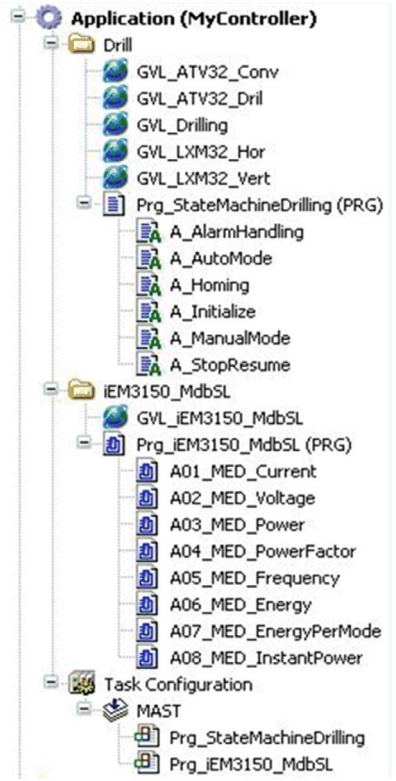
Drilling Control

Overview

The brief description of the project template contains the description of different modes, functionality, and the detected alarms.

Application_Mast

The application master task executes programs for drilling axis such as, monitoring the presence of CANopen devices and Energy Efficiency parameters. It also connects global variables used for configuring to the application.



Components of Application_Mast Task

The `Prg_StateMachineDrilling` program consists of following different actions to perform the drilling task:

- A_AutoMode
- A_AlarmHandling
- A_Homing
- A_Initialize
- A_ManualMode
- A_StopResume

Each of these actions is explained in detail in the below sections.The different GVL consists of variables, which are used in the action for exchange of information with the HMI and with other POUs. The main program lists the PLCopen FB used in the application.

Cyclic task is defined in the **Task Configuration** of the application.

Also, the application consists of `Prg_iEM3150_MdbSL` to monitor the different electrical reading from the power meter. The different parameters measured are listed as follows:

- Current
- Voltage
- Power
- PowerFactor
- Frequency
- Energy
- EnergyPerMode
- Instant Power

Initialization State (`A_Initialize`)

The `A_Initialize` action, performs the following operations:

- Verifies the availability of the CANopen network to perform the operation.
- Verifies the availability of different devices in the network.
- Generates a detected alarm when the network or devices are in error state.
- Verifies for Emergency E- Stop and Emergency Door status

Homing (`A_Homing`)

The `A_Homing` action performs the following operations:

- Verifies the availability of the device to perform the operation
- `MC_Home_LXM32` FB is used for homing of 2 servo axes.
- Performs homing of horizontal axis.
- Performs homing of vertical axis.
- A detected homing alarm is displayed in the **alarm** page of the HMI screen.
- One limit switch in the horizontal axis and one in the vertical axis are needed to perform homing.

NOTE: Homing Mode 33 is used in the application. For more information on Homing mode, refer to the *Lexium 32A drive user manual*.

Alarm Handling (A_AlarmHandling)

The A_AlarmHandling action resets the different detected alarms of the drives based on user input and performs the following operations:

- Verifies for the reset input from HMI
- Uses the MC_Reset_xxx FB to reset the detected alarms in the drives.
- Resets the vertical axis.
- Resets the horizontal axis.
- Resets the drilling drive.
- Resets the feeder conveyor drive.
- During initialization in Auto mode, reset is performed automatically without any input from the operator.
- If the reset is successful, it resumes the operation.

Manual Mode (A_ManualMode)

In A_ManualMode action, you can perform the following actions manually by sending commands from the HMI:

- Verifies the availability of CANopen network.
- Uses the CIA405.GET_STATE FB to know the status of the CANopen network.
- FB MC_Power_xxx powers the drives.
- You can perform jog operation of the axis using the MC_Jog_xxx.
- The command forward /reverse /speed has to be provided from the HMI screen.
- You can perform the homing of the horizontal and vertical axes when the system is in Manual mode.

Auto Mode (A_AutoMode)

The A_AutoMode action performs the following operations automatically:

- Verifies whether homing is done else performs homing if not done.
- Moves the vertical axis to the working position.
- Moves the horizontal axis to the working position.
- Verifies if the dimensions entered and the number of holes to be drilled are aligned.
- Generates the dimension error detected if incorrect.
- Starts a feeder conveyor and runs for a pre-defined time.
- Performs clamping operation to hold the object during drilling.
- Starts the drilling motor.
- Generates an alarm if any error is detected in the drilling motor.
- Moves the horizontal axis to first hole drill position and then, subsequent holes to the desired position.
- Performs the calculation to drill the hole vertically based on user input and working position condition.
- Moves drilling to predefine position for the next hole after completion of the drilling.
- Calculates the number of holes drilled and remaining number of holes to be drilled and performs the drilling operation and displays in the HMI for reference.
- Unclamps the object when the defined holes are drilled.
- Moves the axes back to the working position after the completion of the drilling operation.

- Starts the feeder conveyor and runs for a predefined time to unload the material after drilling.
- Waits for the next cycle start command.
- Calls `A_AlarmHandling` action if any of the state is in Auto mode and there is a detected axes alarm.
- If you have interrupted the auto sequence and there are no changes in the original positioning of axes or object to be drilled, it drills remaining number of holes on resume of the operation and the operation is completed.

The following example shows how the distance to be calculated:

Position to be moved = ((`NumberOfPulsesPerRev * DistanceToBeMoved`)/`CircumferenceOfTheShaft`)

Example:

In the drive settings, if `ScalePOSnum` = 1, `ScalePOSdenom` = 16384,

the `NumberOfPulsesPerRev` = `ScalePOSdenom` /`ScalePOSnum` = 16384/1 = 16384

If the circumference of the shaft is 10 cm, the number of pulses needed to move a distance of 20 cm is = ((16384 *20)/10) = 32768.

NOTE:

1. The circumference value of the shaft motor is set to a default value of 10 in the application for both horizontal and vertical axes. The value has to be changed based on the variables `uiCircumVer` (Vertical axis) and `uiCircumHor` (Horizontal axis) of machine type in the application.
2. The circumference values are independent of the units.
3. Number of pulses per revolution to make 1 revolution has to be declared in the program in the variables `udiPulsePerRevH` (Horizontal axis) and `diPulsePerRevV` (Vertical axis).

Section 6.5
Energy Efficiency

Energy Efficiency

Overview

In the program `Prg_iEM3150_MdbSL`, different actions are performed to read the energy parameters for monitoring purpose.

The following list shows the actions used from the Energy Efficiency libraries for measuring the different parameters from a Power meter.

- `A01_MED_Current`
- `A02_MED_Voltage`
- `A03_MED_Power`
- `A04_MED_PowerFactor`
- `A05_MED_Frequency`
- `A06_MED_Energy`
- `A07_MED_EnergyPerMode`
- `A08_MED_InstantPower`

For more detailed information about the function block and pin details, refer the help manual of:

- EnergyEfficiencyToolbox Library Guide *(see Energy Efficiency Toolbox, Library Guide)*
- ModbusEnergyEfficiencyToolbox Library Guide *(see Modbus Energy Efficiency Toolbox, Library Guide)*
- Machine Energy Dashboard Library Guide *(see SoMachine, Machine Energy Dashboard Library Guide)*

Section 6.6
HMI STU855 Display

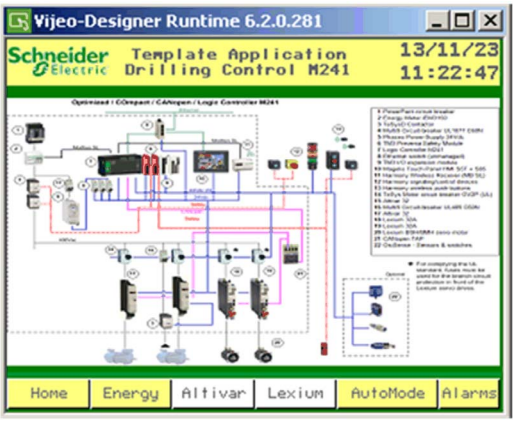
HMI STU855 Display

Overview

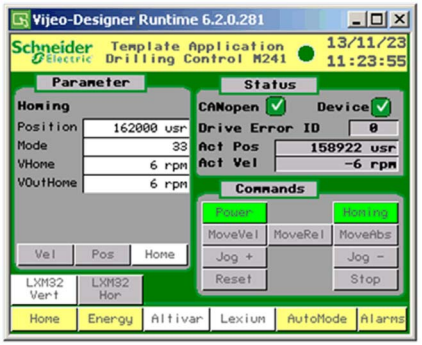
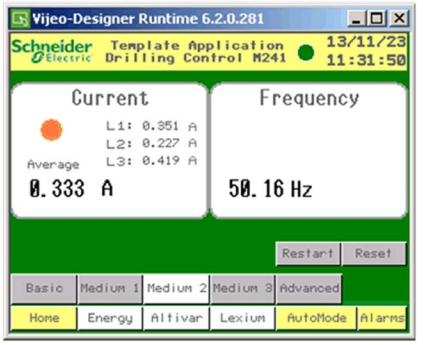
The panel used in this project template is a Magelis HMIS5T (HMIS65/S85). You can parameterize, control, and monitor the different operations of the drilling machine.

Programming of the Magelis HMI is done by using Vijeo-Designer software integrated in SoMachine.

The panel below shows the different tabs available in HMI **Home** screen:



This table describes different tabs of the panel with description:

Tab	Panel	Description
AutoMode		This panel shows the velocity for different axis and the working position coordinates to be defined for horizontal and vertical axes.
Lexium		Here, you can manually operate LXM32A drives. Different modes are available in manual operation.
Energy		Here, you can monitor different energy efficiency parameters from the panels.