How to...

... set up Modbus TCP/IP communication between Altivar Process & M221

06/2015

GOAL:

Being able to set up communication between a M221 controller and a Altivar Process using Modbus TCP/IP. With this communication you should be able to control the Start / Stop of the Altivar Process and send a speed set point.





BEFORE STARTING

This manual assumes you already have basic knowledge of the SoMachine Basic software, knowing how to add variables, how to make a connection to a PLC and perform a download. If not, please refer to the documentation of the workshop of the M221 Controller.

Setting up communication between an Altivar Process and a M221 controller to control its speed and command, it is important to understand that in perspective of the M221 controller, there will be 2 variables that will be sent and 2 variables that will be received.

RECEIVE / READ	Status of Altivar (in run, fault,) Frequency feedback (what is the frequency ouput of the Altivar)
SEND / WRITE	Command to the Altivar (Start / Stop, reset fault,) Frequency set point (the desired frequency)

Setting up communication between a PLC and the Altivar Process can be done in 2 methods.

Method 1 is directly addressing the registers of the drive. The PLC will read and write the Status Word and Command Word directly with its Modbus address. The big advantage of this method is it requires a minimum of configuration on drive side. The setting up of the communication happens almost completely in the PLC. The disadvantage is that when you want to read or write several registers who are not consecutive, you will need to use multiple reading and writing command and messages which can affect the speed of the communication.

Method 2 is using the Com Scanner of the Altivar Process. The Com Scanner allows you to set up a list of various registers of the drive which the drive will group together. It requires a little bit of configuration on the side of the drive but the big advantage is that you can read or write 32 various registers in 1 command.

This manual will explain both methods.



STEP 1 SET UP COMMUNICATION PARAMETERS

In a Modbus TCP/IP communication, it is important that all devices are located in the same subnet. This means that IP addresses need to be in the same subnet.

Altivar Process

The settings for Modbus TCP/IP communication can be found in the menu 6. Communication and in Embedded Ethernet communication.

 IP
 192.168.1.12

 Subnet Mask
 255.255.255.0

 Gateway
 0.0.0.0

In the Altivar Process we will also have to set up that the Altivar will be controlled by a controller communicating over Modbus TCP/IP.

Therefore go in menu 5.4 Command and Reference and change the setting Ref Freq 1 Config to Embedded Ethernet.

Perform a power cycle to ensure that all settings are taken into account.

M221

The settings for the M221 controller are located in the menu Configuration > ETH1

	Programming Display	Commissioning
	Ethernet	
 Messages MyController (TM221ME16T/G) Digital inputs Digital outputs Analog inputs High Speed Counters Pulse Generators IO Bus D Bus ETH1 Modbus TCP SL1 (Serial line) 	Device name IP address by DHCP IP address by BOOTP Fixed IP address IP address Subnet mask Gateway address Transfer Rate Security Parameters IV Programming protocol enabled IV Auto discovery protocol enabled IV Modbus server enabled	M221 192 · 168 · 1 · 15 255 · 255 · 255 · 0 0 · 0 · 0 · 0 Auto

We will also have to add the Altivar Process as a client in the network. Go to Configuration > ETH 1 > Modbus TCP and add the IP address of the Altivar Process.



Pay attention to the Unit ID. Depending on which method you are using, the Unit ID will be different. For addressing the registers directly, Unit ID 248 will be used. For using the Com Scanner, Unit ID 255 is required.

Modbus TCP/IP - Altivar Process & M221



METHOD 1: Directly addressing registers

Modbus TCP						
Client mode: Remote Server tabl	le (max 16)					
Address	192 . 168 . 1 . 12 Add					
Unit ID	248					
Connection timeout (100 ms)	100					

A first connection should be added like this:

	Index	Address	Unit ID	Connection timeout (100 n
	× 1	192.168.1.12	248	100

IP address 192.168.1.12 has now received the Index number 1.



If your computer is connected to the Modbus TCP/IP network, you can test the settings of the IP addresses by pinging both devices.

Go to Start > Run and type "cmd". In the Command Prompt type "ping 192.168.1.12" for the Altivar and type "ping 192.168.1.15" for the M221. You should get a response time.

STEP 2 ADD A READ FUNCTION BLOCK

Go to the Programming tab and add a READ_VAR function block in the first POU and the first Rung.

Configuration		Progra	amming		😣 Displa	1		(Commissionin	9	
	L₂J ► /	 New POU 	Comment			(/) -(s) -(R) -(#) -(#0) -				
ED ·	ne Comment	-	÷			-					
	2	÷		2	123 #22						
	÷.				11123 11123		ā.		ā.		
					\$.	Read Write Write Write	/ar Var _{Read} (Read Va				
						Send F	Receive Message				



Add a contact that will trigger the read action. Be aware that the READ_VAR function block will only be executed on a rising edge. This means the contact will have to have a transition from 0 to 1 in order for a read action.

If you like, you can add the symbol "READ_CMD" to the contact like in the example provided.



Double click on the READ_VAR function block to open the configuration screen of the READ_VAR function block. Configure the FB like the example.

Rea	ad Var properties									
	Used	Address	Symbol	Link	Id	Timeout	ObjType	FirstObj	Quantity	IndexData Comment
	\checkmark	%READ_VAR0		3 - ETH1	1	100	0 (Holding reg Mbs 3)	3201	2	10
		%READ_VAR1		1 - SL1	1	100	0 (Holding reg Mbs 3)	0	1	0
		%READ_VAR2		1 - SL1	1	100	0 (Holding reg Mbs 3)	0	1	0

In this example 2 registers are read, register 3201 (Status Word) and register 3202 (Motor Frequency). The values of the read command are stored in the memory objects %MW10 and %MW11 in the M221 controller (as configured in the IndexData).



To keep the naming of all memory objects clear, you can add clear names as a symbol. To do this, go to Programming > Tools > Memory Words. Add STATUS_WRD to %MW10 and FREQ_PV to %MW11.

STEP 3 PERFORM A FIRST TEST OF YOUR COMMUNICATION



Go in tab Commissioning and login to your M221 Controller. You should get the message that the application of PC and controller are different. Please perform a download.

To test your application and verify if you have Modbus communication with your Altivar Process, you have to create an animation table.

Go to Programming > Tools and right click on Animation tables and add a new animation table. You should have an Animation table in the bottom of your screen where you can add the memory objects of the read command.

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Modbus TCP/IP - Altivar Process & M221 *METHOD 1:* Directly addressing registers

	asks To Messag Animati Image: Animatic sector Memory Image: Animatic sector No Image: Animatic sector No Image: Sector Symbol Image: Animatic sector Memory Image: Animatic sector Templa	pols jes ion tables y objects objects zets re Objects sects re Objects unication Obje d Var e Read Var d Receive Me and Replace list y consumption tes	Add new animation t acts ssage	able				
%	/10						Add Insert	
	Used	Trace	Address		Symbol	Value	Force	Comr
	\checkmark		%MW10		STATUS_WRD	592		
			%MW11		FREQ_PV	0		
ŀ			%М0		READ_CMD	1		

Don't forget that the read command is only executed when the READ_CMD has a rising edge. For a first test, you can also add the system variable %S5 instead of %M0. System variable will generate a pulse every 100ms which automatically generates a rising edge.

If communication is ok, you should get a value in the STATUS_WORD of the Altivar.

STEP 4 ADD A WRITE FUNCTION BLOCK

In the same way as the Read FB, we will now add a Write function block. In this way we can write a start / stop command and a speed set point.

 Properties
 Configuration
 Programming

 Tasks
 Tools

 Messages
 Messages

 Animation tables
 Animation table_0

Go to the Programming tab and add a second Rung.

Add WRITE_VAR function block in the first POU and the second Rung.





Add a contact that will trigger the read action. Be aware that the WRITE_VAR function block will only be executed on a rising edge. This means the contact will have to have a transition from 0 to 1 in order for a read action.

If you like, you can add the symbol "WRITE_CMD" to the contact like in the example provided.



Double click on the WRITE_VAR function block to open the configuration screen of the WRITE_VAR function block. Configure the FB like the example.

V	Vrite	/rite Var properties									
	l	Used	Address	Symbol	Link	Id	Timeout	ObjType	FirstObj	Quantity	IndexData Comment
		\checkmark	%WRITE_VAR0		3 - ETH:	11	100	0 (Mult. reg Mbs 16)	8501	2	12
			%WRITE_VAR1		1 - SL1	1	100	0 (Mult. reg Mbs 16)	0	1	0

In this example 2 registers are written, register 8501 (Command Word) and register 8502 (Reference Frequency). The values of the write command are coming from the memory objects %MW12 and %MW13 in the M221 controller (as configured in the IndexData).





To keep the naming of all memory objects clear, you can add clear names as a symbol. To do this, go to Programming > Tools > Memory Words. Add COMMAND_WRD to %MW12 and FREQ_SP to %MW13.

To ensure there is a constant switch between the read and write command, make sure the Read FB sets %M1 and resets %M0 and that the write command sets %M0 and resets %M1.



STEP 5 GO ONLINE AND START ALTIVAR

Add the 2 new memory objects to your existing Animation table. It should look like this:

%1	/11					Add Insert	
	Used	Trace	Address	Symbol	Value	Force	Comment
	$[\checkmark]$		%MW10	STATUS_WRD	592		
			%MW11	FREQ_PV	0		
F			%MW12	COMMAND_WRD	0		
ī			%MW13	FREQ_SP	0		
	\bigtriangledown		%M0	READ_CMD	1		
	$(\nabla$		%M1	WRITE_CMD	0		

Don't forget to write 1 to %M0 or to %M1 to start the Modbus communication.





If the Altivar Process in in fault because the PLC did not communicate anymore during download (Status Word = 568 or 16#0238) write 128 in the Command Word. This should reset your drive.

If your drive is in Status 592 (16#0250), write 6 in Command Word. This should change the Status Word to 561 (16#0231). Then write 7 in the Command Word and the Status should change to 563 (16#0233). Lastly write 15 and the Status should change to 1591 (16#0637). This is the Status where the drive is now in Run. The only thing missing is a speed reference. Write 100 in FREQ_SP to make the drive have output 10Hz. You will be able to see the output frequency of the drive in FREQ_PV. To understand this commands see step6.

	Used	Trace	Address	Symbol	Value	Force	Comm
			%MW10	STATUS_WRD	1591		
			%MW11	FREQ_PV	100		
			%MW12	COMMAND_WRD	15		
Þ		Ō	%MW13	FREQ_SP	100		
	$[\nabla]$		%M0	READ_CMD	0		
			%M1	WRITE_CMD	1		

Writing 7 again in the Command Word will stop the drive.



STEP 6 UNDERSTANDING & ADDING THE DRIVE COM

The Altivar Process is working with the Drive Com principle. This means that the status of the Altivar is always located somewhere in a flowchart and that a certain sequence needs to be followed in order to reset the drive or to start the drive. This means that depending on the state the drive is located; the command needs to be according.

Power section line supply present or absent Fault Entry into From all states state chart 13 Fault Fault reaction active Not ready to switch on 1 7 Fault disappeare and faults reset CMD=16#0080 14 Fault Switch on disabled -15 ETA=16#xxx8 ETA=16#xx40 8 ETA=16#xx50 0 "NST" 2 Disable voltage CMD=16#0000 Disable voltage CMD=16#6000 STOP key Disable Shutdown CMD=16#0006 If Quick stop option code freewheel stop at voltage CMD=16#0000 Quick stop CMD=16#0002 the terminals transition after stop If Quick stop option code Quick stop CMD=16#0002 STO (Safe STOP key Torque Off) Disable voltage CMD=16#0000 10 STOP key 12 freewheel stop at the terminals STOP key Ready to switch on ETA=16#xx21 freewheel stop at modification minals "NLP of a configuration parame 0 "RDY" 3 Switch on CMD=16#0007 Shutdown CMD=16#0006 Switched on Shutdown CMD=16#0006 "RDY, FST" 4 Disable Enable Switch on 3B operation CMD=16#xxx7 5 operation CMD=16#xxxF fast stop Operation enabled Quick stop active Quick stop CMD=16#0002 ETA=16#xx37 11 5 "RUN, ACC, FST, " "FST DCB" 6 Examples: ETA=16#0637: Stop or forward, speed reached ETA=16#8637: Stop or reverse, speed reached ETA=16#0237: Forward, accelerating or decelerating ETA=16#8237: Reverse, accelerating or decelerating Power section line supply present

For detailed information, please refer to Altivar Process - Embedded Ethernet Manual.



STEP 1 SET UP COMMUNICATION PARAMETERS

In a Modbus TCP/IP communication, it is important that all devices are located in the same subnet. This means that IP addresses need to be in the same subnet.

Altivar Process

The settings for Modbus TCP/IP communication can be found in the menu 6. Communication and in Embedded Ethernet communication.

 IP
 192.168.1.12

 Subnet Mask
 255.255.255.0

 Gateway
 0.0.0.0

In the Altivar Process we will also have to set up that the Altivar will be controlled by a controller communicating over Modbus TCP/IP.

Therefore go in menu 5.4 Command and Reference and change the setting Ref Freq 1 Config to Embedded Ethernet.

Perform a power cycle to ensure that all settings are taken into account.

M221

The settings for the M221 controller are located in the menu Configuration > ETH1

	Programming Display	Commissioning
	Ethernet	
 Messages MyController (TM221ME16T/G) Digital inputs Digital outputs Analog inputs High Speed Counters Pulse Generators IO Bus D Bus ETH1 Modbus TCP SL1 (Serial line) 	Device name IP address by DHCP IP address by BOOTP Fixed IP address IP address Subnet mask Gateway address Transfer Rate Security Parameters IV Programming protocol enabled IV Auto discovery protocol enabled IV Modbus server enabled	M221 192 · 168 · 1 · 15 255 · 255 · 255 · 0 0 · 0 · 0 · 0 Auto

We will also have to add the Altivar Process as a client in the network. Go to Configuration > ETH 1 > Modbus TCP and add the IP address of the Altivar Process.



Pay attention to the Unit ID. Depending on which method you are using, the Unit ID will be different. For addressing the registers directly, Unit ID 248 will be used. For using the Com Scanner, Unit ID 255 is required.



M	Modbus TCP						
	 Client mode: Remote Server tab 	ole (max 16)					
	Address	192 . 168 . 1 . 12 Add					
	Unit ID	255					
	Connection timeout (100 ms)	100					

A first connection should be added like this:

Index	Address	Unit ID	Connection timeout (100 n
× 1	192.168.1.12	255	100

IP address 192.168.1.12 has now received the Index number 1.



If your computer is connected to the Modbus TCP/IP network, you can test the settings of the IP addresses by pinging both devices.

Go to Start > Run and type "cmd". In the Command Prompt type "ping 192.168.1.12" for the Altivar and type "ping 192.168.1.15" for the M221. You should get a response time.

STEP 2 SETTING UP IO SCANNER IN DRIVE

Using the Com Scanner in the drive means you have to configure which registers you want to read and write. This configuration has to be done in the drive. The only way of configuring the Com Scanner is either with the software SoMove or with the webserver of the drive.

SoMove software

In the software go to Parameter List > Fieldbus > Protocol & Drives Profile

≟- Fieldb	ous	
Po	rt - Modbus Serial	
Ė. Po	ort - Modbus TCP	
	Generic Settings	
	Protocol & Drive Profiles	N
	FDR	45



In the menu Drive I/O Profile there are 2 lists available. One list are the inputs, registers the PLC is reading from the drive. The second list are the outputs, registers the PLC is writing to the drive.

In this screen you can now add registers / variables to the Com Scanner with a right-click and select the register you wish to read.

Inputs (Drive to	Controller)				
Channel	Code	Description			Logical address
1	ETA	CIA402 State Register	3201		
2	RFRD	DRIVECOM : Actual speed	d valu	e	8604
3					
4				Insert	
5				Modify ¹⁶	
6				Suppress	
7			_		
 FRH : Refere LCR : Motor OTR : Motor UOP : Motor UOP : Motor THD : Drive t OPR : Motor RFRQ : Very FRHT : Frequ SLCR : Estim SRFR : Estim SOTR : Outp SUI N : Main 	nce frequency current torque voltage hemal state power high resolution uency referenc ated motor cur ated motor free ut torque value voltage ms w III	estimated motor frequency (G e before ramp (Q15=TFR) (ab rent without filter quency (signed value) without e (100% = Cn motor) without fil ithout filter Add Cancel	tit ter ►		



Do not forget to validate with the "Apply changes" button.

And send the changes to drive.



STEP 3 ADD A READ FUNCTION BLOCK

Go to the Programming tab and add a READ_VAR function block in the first POU and the first Rung.

Configuration	Programming	8 Display	Commissioning
	+ 1 - New POU Comment		
LD Iname Commer	r		
		. 123	
	ā: ā:		· · · · · ·
		Read Van Write Va Write Re	ar kan a second se
		Send Rec	eceive Message

Add a contact that will trigger the read action. Be aware that the READ_VAR function block will only be executed on a rising edge. This means the contact will have to have a transition from 0 to 1 in order for a read action.

If you like, you can add the symbol "READ_CMD" to the contact like in the example provided.



Double click on the READ_VAR function block to open the configuration screen of the READ_VAR function block. Configure the FB like the example.

Rea	Read Var properties									
	Used	Address	Symbol	Link	Id	Timeout	ObjType	FirstObj	Quantity	IndexData Comment
		%READ_VAR0		3 - ETH1	1	100	0 (Holding reg Mbs 3)	0	32	0
		%READ_VAR1		1 - SL1	1	100	0 (Holding reg Mbs 3)	0	1	0
		%READ_VAR2		1 - SL1	1	100	0 (Holding reg Mbs 3)	0	1	0



In this example 32 registers are read starting from register 0 (first register of the Com Scsanner. These values of the read command are stored in the memory objects, starting from %MW0 (as configured in the IndexData). For this example %MW0 will be Status Word and %MW1 will be Speed Feedback.



To keep the naming of all memory objects clear, you can add clear names as a symbol. To do this, go to Programming > Tools > Memory Words. Add STATUS_WRD to %MW0 and FREQ_PV to %MW11.

STEP 4 PERFORM A FIRST TEST OF YOUR COMMUNICATION



Go in tab Commissioning and login to your M221 Controller. You should get the message that the application of PC and controller are different. Please perform a download.

To test your application and verify if you have Modbus communication with your Altivar Process, you have to create an animation table.

Go to Programming > Tools and right click on Animation tables and add a new animation table. You should have an Animation table in the bottom of your screen where you can add the memory objects of the read command.

Tuana	Tools					
	elessages nimation tables lemory objects ystem objects O objects TO objects ommunication O Read Var Write Var Write Var Write Read Var Send Receive I earch and Replat lemory consump amplates	Add new animation tab ojects Aessage ce	le			
%M0					Add Insert	
%M0 Use	ed Trace	Address	Symbol	Value	Add Insert	Com
%M0 Use	ed Trace	Address %MW0	Symbol STATUS_WRD	Value 592	Add Insert Force	Com
%M0 Usi	ed Trace	Address %MW0 %MW1	Symbol STATUS_WRD FREQ_PV	Value 592 0	Add Insert Force	Com

Don't forget that the read command is only executed when the READ_CMD has a rising edge. For a first test, you can also add the system variable %S5 instead of %M0. System variable will generate a pulse every 100ms which automatically generates a rising edge.

If communication is ok, you should get a value in the STATUS_WORD of the Altivar.



STEP 5 ADD A WRITE FUNCTION BLOCK

In the same way as the Read FB, we will now add a Write function block. In this way we can write a start / stop command and a speed set point.

Go to the Programming tab and add a second Rung.

Properties	Configuration	Programming
Tasks Tools Messages Animation tables Animation table 0	리나크+ 크- 프로 나라	

Programming **∃** - -) -(/) -(s) -(R) -(#) -(#0) -... + * IL > LD LD > IL - + 1 - New POU 0 🖌 LD 🕞 READ_CMD 1010 RungO 36M0 Do . READ_VARO 123 Link: 1 - SL1 . . Id: 1 123 eout: 100 ObjType: 0 (Holding reg. - Mbs 3) FirstObj: 0 Quantity: 1 IndexData: 0 B 1123 11123 G. Abor ЛЛ ТË Er \geq innn 3 Write Var Write Read Va Write Var Send Receive Message

Add WRITE_VAR function block in the first POU and the second Rung.

Add a contact that will trigger the read action. Be aware that the WRITE_VAR function block will only be executed on a rising edge. This means the contact will have to have a transition from 0 to 1 in order for a read action.

If you like, you can add the symbol "WRITE_CMD" to the contact like in the example provided.



Double click on the WRITE_VAR function block to open the configuration screen of the WRITE_VAR function block. Configure the FB like the example.

									-	
Wri	te Var pr	operties								
	Used	Address	Symbol	Link	Id	Timeout	ObjType	FirstObj	Quantity	IndexData Cor
	\checkmark	%WRITE_VAR0		3 - ETH1	1	100	0 (Mult. reg Mbs 16)	0	32	40
		%WRITE_VAR1		1 - SL1	1	100	0 (Mult. reg Mbs 16)	0	1	0
		%WRITE_VAR2		1 - SL1	1	100	0 (Mult. reg Mbs 16)	0	1	0

In this example 32 registers are written, starting with register 0. Following the configuration of our Com Scanner register 0 will be the COMMAND_WORD and register 1 will be FREQ_SP. The values of the write command are coming from the memory objects starting at %MW40 in the M221 controller (as configured in the IndexData).



To keep the naming of all memory objects clear, you can add clear names as a symbol. To do this, go to Programming > Tools > Memory Words. Add COMMAND_WRD to %MW40 and FREQ_SP to %MW41.

To ensure there is a constant switch between the read and write command, make sure the Read FB sets %M1 and resets %M0 and that the write command sets %M0 and resets %M1.





STEP 6 GO ONLINE AND START ALTIVAR

Add the 2 new memory objects to your existing Animation table. It should look like this:

%M1					Add Insert	
Used	Trace	Address	Symbol	Value	Force	Comment
		96MW0	STATUS_WRD	592		
		%MW1	FREQ_PV	0		
		%MW40	COMMAND_WRD	0		
D		%MW41	FREQ_SP	0		
(\forall)		%M0	READ_CMD	1		
\odot		%M1	WRITE_CMD	0		

Don't forget to write 1 to %M0 or to %M1 to start the Modbus communication.



If the Altivar Process in in fault because the PLC did not communicate anymore during download (Status Word = 568 or 16#0238) write 128 in the Command Word. This should reset your drive.



If your drive is in Status 592 (16#0250), write 6 in Command Word. This should change the Status Word to 561 (16#0231). Then write 7 in the Command Word and the Status should change to 563 (16#0233). Lastly write 15 and the Status should change to 1591 (16#0637). This is the Status where the drive is now in Run. The only thing missing is a speed reference. Write 100 in FREQ_SP to make the drive have output 10Hz. You will be able to see the output frequency of the drive in FREQ PV. To understand this commands see step6.

%M	11					Add Insert	
	Used	Trace	Address	Symbol	Value	Force	Com
			%MW0	STATUS_WRD	1591		
			%MW1	FREQ_PV	100		
			%MW40	COMMAND_WRD	15		
٠.			%MW41	FREQ_SP	100		
73	()		%M0	READ_CMD	0		
	(\mathbf{V})		%M1	WRITE_CMD	1		

Writing 7 again in the Command Word will stop the drive.



STEP 7 UNDERSTANDING & ADDING THE DRIVE COM

The Altivar Process is working with the Drive Com principle. This means that the status of the Altivar is always located somewhere in a flowchart and that a certain sequence needs to be followed in order to reset the drive or to start the drive. This means that depending on the state the drive is located; the command needs to be according.

Power section line supply present or absent Fault Entry into From all states state chart 13 Fault Fault reaction active Not ready to switch on 1 7 Fault disappeare and faults reset CMD=16#0080 14 Fault Switch on disabled -15 ETA=16#xxx8 ETA=16#xx40 8 ETA=16#xx50 0 "NST" 2 Disable voltage CMD=16#0000 Disable voltage CMD=16#6000 STOP key Disable Shutdown CMD=16#0006 If Quick stop option code freewheel stop at voltage CMD=16#0000 Quick stop CMD=16#0002 the terminals transition after stop If Quick stop option code Quick stop CMD=16#0002 STO (Safe STOP key Torque Off) Disable voltage CMD=16#0000 10 STOP key 12 freewheel stop at the terminals STOP key Ready to switch on ETA=16#xx21 freewheel stop at modification minals "NLP of a configuration parame 0 "RDY" 3 Switch on CMD=16#0007 Shutdown CMD=16#0006 Switched on Shutdown CMD=16#0006 "RDY, FST" 4 Disable Enable Switch on 3B operation CMD=16#xxx7 5 operation CMD=16#xxxF fast stop Operation enabled Quick stop active Quick stop CMD=16#0002 ETA=16#xx37 11 5 "RUN, ACC, FST, " "FST DCB" 6 Examples: ETA=16#0637: Stop or forward, speed reached ETA=16#8637: Stop or reverse, speed reached ETA=16#0237: Forward, accelerating or decelerating ETA=16#8237: Reverse, accelerating or decelerating Power section line supply present

For detailed information, please refer to Altivar Process - Embedded Ethernet Manual.

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