

Seguimiento de diagrama de estados de ATV12

Altivar 12

Autor: Sergio Núñez Núñez

Versión	Autor	Fecha	Comentarios
V 1.0	S.Núñez	28/11/11	

Se realiza la prueba del diagrama de estados del ATV12 según el estándar IEC 61800-7. Utilizamos un PLC M258 donde configuramos un IOscanner de modbus.

- Parámetros a intercambiar cíclicamente:

Submenu	On the local HMI, it is parameter description	Factory setting parameter	Modbus address
ICS -	NMA1 (n P R 1) Source drive address of the 1st input word	Address of ETA=3201 16#0C81	NMA1 address 12701 16#319D
	NMA2 (n P R 2) Source drive address of the 2nd input word	Address of RFRD=8604 16#219C	NMA2 address 12702 16#319E
	NMA3 (n P R 3) Source drive address of the 3rd input word	0	NMA3 address 12703 16#319F
	NMA4 (n P R 4) Source drive address of the 4th input word	0	NMA4 address 12704 16#31A0
DCS -	NCA1 (n C R 1) Destination drive address of the 1st output word	Address of CMD=8501 16#2135	NCA1 address 12721 16#31B1
	NCA2 (n C R 2) Destination drive address of the 2nd output word	Address of LFRD=8602 16#219A	NCA2 address 12722 16#31B2
	NCA3 (n C R 3) Destination drive address of the 3rd output word	0	NCA3 address 12723 16#31B3
	NCA4 (n C R 4) Destination drive address of the 4th output word	0	NCA3 address 12724 16#31B4

- Parámetros del variador:

Código	Etiqueta larga	Valor actual	Valor predeterminado
ADD	Dirección Modbus	10	1
TBR	Vel. trans. Modbus	19.2 kBps	19.2 kBps
TFO	Formato Modbus	8-E-1	8-E-1
TTO	Timeout Modbus	10 s	10 s

Código	Etiqueta larga	Valor actual	Valor predeterminado
LAC	Nivel acceso funciones	Nivel 3	Nivel 1
FR1	Canal Referencia 1	Modbus	AI1
FR2	Canal Referencia 2	No	No
RFC	Asig.conmut.ref.(1 a 2)	Canal1 act.	Canal1 act.
CHCF	Config. modo control	No separad.	No separad.

Command word description CMD - 8501

bit 7	bit 6	bit 5	bit 4	bit 3	bit 2	bit 1	bit 0
0 to 1 transition : Fault reset	Reserved (=0)	Reserved (=0)	0:Free wheel staying in "Operation Enabled"	Enable operation Drivecom state activation	Quick stop Drivecom state activation (bit active at 0)	Switch on disabled. Drivecom state activation (bit active at 0)	Switch on
bit 15	bit 14	bit 13	bit 12	bit 11	bit 10	bit 9	bit 8
Reserved	Not assignable	Reserved	Reserved	Direction of rotation asked 0: Forward 1: Reverse	Reserved (=0)	Reserved (=0)	0: RUN asked 1: STOP asked

Status word description ETA - 3201

bit 7	bit 6	bit 5	bit 4	bit 3	bit 2	bit 1	bit 0
Reserved (always 0)	Switch on disabled	Quick stop (bit active at 0)	Powerstage is supplied (bit always on)	Malfunction, fault present	Operation enabled	Switched on	Ready to switch on
bit 15	bit 14	bit 13	bit 12	bit 11	bit 10	bit 9	bit 8
0: Motor rotation in forward direction (or stopped)	Stop via STOP key	Reserved (=0)	Reserved (=0)	Reference exceeded (< LSP or > HSP)	Reference reached (steady state)	Local mode (bit active at 0)	Reserved (=0)

1) Lectura del estado inicial del variador:

ETA= 0250(hex) : Switch On disabled

Variable	Mapping	Channel	Address	Type	Default Value	Current Value
		Channel 1	%IW5	WORD		16#0250
		Bit 0	%IX10.0	BOOL	'FALSE'	FALSE
		Bit 1	%IX10.1	BOOL	'FALSE'	FALSE
		Bit 2	%IX10.2	BOOL	'FALSE'	FALSE
		Bit 3	%IX10.3	BOOL	'FALSE'	FALSE
		Bit 4	%IX10.4	BOOL	'FALSE'	TRUE
		Bit 5	%IX10.5	BOOL	'FALSE'	FALSE
		Bit 6	%IX10.6	BOOL	'FALSE'	TRUE
		Bit 7	%IX10.7	BOOL	'FALSE'	FALSE
		Bit 8	%IX11.0	BOOL	'FALSE'	FALSE
		Bit 9	%IX11.1	BOOL	'FALSE'	TRUE
		Bit 10	%IX11.2	BOOL	'FALSE'	FALSE
		Bit 11	%IX11.3	BOOL	'FALSE'	FALSE
		Bit 12	%IX11.4	BOOL	'FALSE'	FALSE
		Bit 13	%IX11.5	BOOL	'FALSE'	FALSE
		Bit 14	%IX11.6	BOOL	'FALSE'	FALSE
		Bit 15	%IX11.7	BOOL	'FALSE'	FALSE
		Channel 1	%QW2	WORD		16#0000

2) Escribimos 6 para pasar a Ready to switch on:

ETA=231(hex) : Ready to switch on

Variable	Mapping	Channel	Address	Type	Default Value	Current Value
		Channel 1	%IW5	WORD		16#0231
		Bit 0	%IX10.0	BOOL	'FALSE'	TRUE
		Bit 1	%IX10.1	BOOL	'FALSE'	FALSE
		Bit 2	%IX10.2	BOOL	'FALSE'	FALSE
		Bit 3	%IX10.3	BOOL	'FALSE'	FALSE
		Bit 4	%IX10.4	BOOL	'FALSE'	TRUE
		Bit 5	%IX10.5	BOOL	'FALSE'	TRUE
		Bit 6	%IX10.6	BOOL	'FALSE'	FALSE
		Bit 7	%IX10.7	BOOL	'FALSE'	FALSE
		Bit 8	%IX11.0	BOOL	'FALSE'	FALSE
		Bit 9	%IX11.1	BOOL	'FALSE'	TRUE
		Bit 10	%IX11.2	BOOL	'FALSE'	FALSE
		Bit 11	%IX11.3	BOOL	'FALSE'	FALSE
		Bit 12	%IX11.4	BOOL	'FALSE'	FALSE
		Bit 13	%IX11.5	BOOL	'FALSE'	FALSE
		Bit 14	%IX11.6	BOOL	'FALSE'	FALSE
		Bit 15	%IX11.7	BOOL	'FALSE'	FALSE
		Channel 1	%QW2	WORD		16#0006

3) Enviamos el 7 para pasar a Switched On:

ETA=233hex : Switched On



Variable	Mapping	Channel	Address	Type	Default Value	Current Value
		Channel 1	%IW5	WORD		16#0233
		Bit 0	%IX10.0	BOOL	'FALSE'	TRUE
		Bit 1	%IX10.1	BOOL	'FALSE'	TRUE
		Bit 2	%IX10.2	BOOL	'FALSE'	FALSE
		Bit 3	%IX10.3	BOOL	'FALSE'	FALSE
		Bit 4	%IX10.4	BOOL	'FALSE'	TRUE
		Bit 5	%IX10.5	BOOL	'FALSE'	TRUE
		Bit 6	%IX10.6	BOOL	'FALSE'	FALSE
		Bit 7	%IX10.7	BOOL	'FALSE'	FALSE
		Bit 8	%IX11.0	BOOL	'FALSE'	FALSE
		Bit 9	%IX11.1	BOOL	'FALSE'	TRUE
		Bit 10	%IX11.2	BOOL	'FALSE'	FALSE
		Bit 11	%IX11.3	BOOL	'FALSE'	FALSE
		Bit 12	%IX11.4	BOOL	'FALSE'	FALSE
		Bit 13	%IX11.5	BOOL	'FALSE'	FALSE
		Bit 14	%IX11.6	BOOL	'FALSE'	FALSE
		Bit 15	%IX11.7	BOOL	'FALSE'	FALSE
		Channel 1	%QW2	WORD		16#0007



Status word description ETA - 3201

bit 7	bit 6	bit 5	bit 4	bit 3	bit 2	bit 1	bit 0
Reserved (always 0)	Switch on disabled	Quick stop (bit active at 0)	Powerstage is supplied (bit always on)	Malfunction, fault present	Operation enabled	Switched on	Ready to switch on

bit 15	bit 14	bit 13	bit 12	bit 11	bit 10	bit 9	bit 8
0: Motor rotation in forward direction (or stopped)	Stop via STOP key	Reserved (=0)	Reserved (=0)	Reference exceeded (< LSP or > HSP)	Reference reached (steady state)	Local mode (bit active at 0)	Reserved (=0)

4) Enviamos la orden de marcha F(hex) = 15(dec) junto con consigna de velocidad en LFRD=1500 (rpm) y obtenemos ETA=1591(dec)=637(hex) : **Operation Enabled**

Variable	Mapping	Channel	Address	Type	Default Value	Current Value
Actual_Speed		Channel 2	%IW5	WORD		1500
Speed_Reference		Channel 2	%QW2	WORD		1500

Variable	Mapping	Channel	Address	Type	Default Value	Current Value
ETA		Channel 1	%IW7	WORD		1591
		Bit 0	%IX14.0	BOOL	'FALSE'	TRUE
		Bit 1	%IX14.1	BOOL	'FALSE'	TRUE
		Bit 2	%IX14.2	BOOL	'FALSE'	TRUE
		Bit 3	%IX14.3	BOOL	'FALSE'	FALSE
		Bit 4	%IX14.4	BOOL	'FALSE'	TRUE
		Bit 5	%IX14.5	BOOL	'FALSE'	TRUE
		Bit 6	%IX14.6	BOOL	'FALSE'	FALSE
		Bit 7	%IX14.7	BOOL	'FALSE'	FALSE
		Bit 8	%IX15.0	BOOL	'FALSE'	FALSE
		Bit 9	%IX15.1	BOOL	'FALSE'	TRUE
		Bit 10	%IX15.2	BOOL	'FALSE'	TRUE
		Bit 11	%IX15.3	BOOL	'FALSE'	FALSE
		Bit 12	%IX15.4	BOOL	'FALSE'	FALSE
		Bit 13	%IX15.5	BOOL	'FALSE'	FALSE
		Bit 14	%IX15.6	BOOL	'FALSE'	FALSE
		Bit 15	%IX15.7	BOOL	'FALSE'	FALSE
CMD		Channel 1	%QW3	WORD		15

Es importante enviar **consigna de velocidad junto a la orden de marcha**. En caso contrario el variador no pasará a Operation Enabled, quedándose en la etapa anterior "Switched On". El display del variador indicará la velocidad actual, 50.0 Hz en este caso.