



CtTwinCAT Driver *Manual*

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1. CtTwinCAT - Driver of ADS Protocol for TwinCAT System

1.1. Driver Use

The driver is designed to data exchange between asix system and TwinCAT system of Beckhoff Industrie Elektronik. The data exchange is performed via Ethernet with using ADS interface of Beckhoff Industrie Elektronik.

CtTwinCAT driver services the following devices:

- controllers of CX1000 series;
- TwinCAT PLC (PC based control system);
- controllers of BC9000 series.

1.2. Declaration of Transmission Channel

CtTwinCAT driver is loaded by universal **asix** driver – UNIDRIVER. The declaration of transmission channel of the driver has the following syntax:

```
channel_name=UNIDRIVER, CtTwinCAT, Port=port_nr; Server=IP_address;  
[Timeout=ms_number;] [TimeSynchr=addr;] [TimeSynchrPeriod=period;][  
ServiceType=type][ StopAlarmNr=number]
```

where:

<i>CtTwinCAT</i>	- driver name;
<i>port_nr</i>	- port number of TwinCAT system router, for example 801 (RTS1), 811 (RTS2);
<i>IP_address</i>	- IP address of TwinCAT system router;
<i>ms_number</i>	- optional; timeout (in msec) of ADS operation; default value – 50000 ms;
<i>addr</i>	- optional; date & time frame is sent to PLC at the given address (may be symbolic or absolute);
<i>period</i>	- period (in seconds) between two adjacent date & time frames sent to PLC; default period - 60 seconds;
<i>type</i>	- service type: CX,PC-PLC (1) orBC9000 (2); default value – 1;
StopAlarmNr= <i>number</i>	- allows alarm generation when PLC switching over the STOP state.

The date & time frame structure is given below:

```
struct dateTime  
{  
word wYear;  
word wMonth;  
word wDayOfWeek;  
word wDay;  
word wHour;  
word wMinute;  
word wSecond;  
word wMilliseconds;  
word wSynchr;
```

```
};
```

where:

wYear	- year	1970 ~ 2106
wMonth	- month	1 ~ 12 (January = 1, February = 2, etc)
wDayOfWeek	- day of week	0 ~ 6 (Sunday = 0, Monday = 1, itd.)
wDay	- day of month	1 ~ 31;
wHour	- hour	0 ~ 23;
wMinute	- minute	0 ~ 59;
wSecond	- second	0 ~ 59;
wMilliseconds	- millisecond	0 ~ 999;
wSynchr	- synchro marker	1 is written with the new data & time frame

EXAMPLE

Below there is an example of declaration of transmission channel named PLC1, that is used for communication with TwinCAT system with AMS 10.10.10.254.1.1 and port 801 (RTS1) with time synchronization frame sent to symbolic address *.tabWord*.

```
PLC1= UNIDRIVER, CTTWINCAT, Port=801; Serwer=10.10.10.254;
TimeSynchr=.tabWord
```

1.3. Addressing the Process Variables

Two types of addresses are allowed:

- **symbolic** – symbolic address of variable in TwinCAT system is used. The form is as follows:

```
[<text1>].<text2>
```

where:

text1, *text2* - ASCII string

Symbolic addresses of all variables of the project realized in TwinCAT system are placed in the project directory, in XML file with the extension *.tpy – addresses are entered in sections identified by key word <Symbol>.

EXAMPLE

```
.engine
MAIN.devUP
```

- **direct** – address in the form **Group:Offset** is used. Both **Group** and **Offset** are declared in HEX format and delimited with colon (:).

EXAMPLE

```
F030:03EA
```

1.4. EXAMPLES OF DECLARATION OF PROCESS VARIABLES

```
JJ_00, variable valFloat (REAL),.valFloat, PLC1, 1, 1, NOTHING_FP
```

JJ_01, variable valWord (WORD),.valWord, PLC1, 1, 1, NOTHING
 JJ_02, variable MAIN.engine (BOOL), MAIN.engine, PLC1, 1, 1, NOTHING_BYTE
 JJ_03, variable with address F030:5 (BYTE), F030:5, PLC1, 1, 1, NOTHING_BYTE

1.5. Type of Variables

For variables with symbolic address the raw type of variable is taken from the variable's type declared in TwinCAT system. This type is converted into the type required by the user.

For variables with direct address the raw type of variable is based on the real type of conversion function defined for this variable. Based on this type:

- the appropriate number of bytes are read/written from/into address specified by **Group:Offset** pair;
- read bytes are converted according to the type defined for the variable.

1.6. Data & Time Stamp

Data read from the driver is stamped with the PC local date & time evaluated at the moment, when the ADS request is completed.

1.7. Driver Configuration

The driver configuration is performed by using a separate section named [CTTWINCAT]. By means of this section it is possible to declare:

- log file and its size,
- size of the buffer used for ADS requests,
- log of telegrams.

[**LOG_FILE=***file_name*

Meaning - the LOG_FILE item allows to define a file to which all the diagnostic messages of the driver and the information about the ADS requests will be written. If item LOG_FILE doesn't define a full path, the log file will be created in the current directory. The log file should be used only during **asix** system development.

Default value - by default, the log file is not created.

Parameter:
file_name - name of the log file.

[**LOG_FILE_SIZE=***number*

Meaning - LOG_FILE_SIZE item allows to define the size of the log file in MB.

Default value - by default, the item assumes that the log file has a size of 1 MB.

Parameter:
number - size of the log file in MB.

[**MAX_BUFFER_LEN=***number*

Meaning - MAX_BUFFER_LEN item allows to define the size of the buffer used to perform ADS read/write requests.

Default value - the default size of the buffer is 1800 bytes.

Parameter:

<i>number</i>	- size of the buffer in bytes.
[<i>LOG_OF_TELEGRAMS=YES/NO</i>
Meaning	- LOG_OF_TELEGRAMS item allows to write the info about performed ADS requests to the log file. This option should be used only during asix system development.
Default value	- by default, the driver does not write the info about ADS requests to the log file.

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