

XMELSECA Driver Manual

Mitsubishi Melsec-Q A-Compatible Protocol Driver



MELSEC
A/Q Series



CPKSoft Engineering

Process Monitoring and Industrial Automation Software

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1. Introduction

CPKSoft Engineering assumes no responsibility for any errors that may appear in this document. If you have any suggestions for improvements or amendments or have found errors in this publication, please notify us.

This driver is included with all unlimited licenses of TAS-HMITalk. It is not sold separately. It requires the TAS-HMITalk ActiveX to work, therefore it cannot be used as a stand-alone driver.

If you use this driver in your applications, you need to include the xmelseca.tlk in the set of files that you distribute. This file must be located in the same folder where the hmitalk.ocx file is registered in order to be found by the activex when the applications are executed.

The source-code for the xmelseca.tlk driver is available in plain-C language for additional USD 499 if you own a license of TAS-HMITalk 8.04 or higher.

Refer to the following link to visit the xmelseca driver page at CPKSoft Engineering website: <http://www.cpksoft.com/tabid/55/ProductID/65/PageIndex/1/Default.aspx>.

Visit this link if you want to see a complete list of drivers that are currently available for TAS-HMITak: <http://www.cpksoft.com/Drivers/tabid/55/Default.aspx>.

Also, refer to this link if you are interested in purchasing a license of the most recent version of TAS-HMITalk: <http://www.cpksoft.com/Products/tabid/54/Default.aspx>.

We welcome your comments about this document. You can reach us by e-mail at [contact @ cpksoft.com](mailto:contact@cpksoft.com).

2. Driver details

2.1. Driver overview

The XMELSECA driver implements the Mitsubishi MELSEC-Q protocol that allows you to read and write data to the Mitsubishi PLCs of the A Series (A2N, A3N), AnA Series and AnU Series using the MELSEC A-Compatible 1C Frames Format 1 or 4 protocol through serial communication modules. Data communication using the A compatible 1C frames is equivalent to the communication function using the dedicated protocol supported by the A series computer link modules. RS-232 and RS-422 multi-drop is supported.

Protocol specifications:

Format: MELSEC-Q A-Compatible 1C Frames using Format 1 or 4 Verification: Checksum Enabled Characters: ASCII codes Memory types supported: X, Y, M, TS, TC, TN, CS, CT, CN, D, R and W Suggested COM settings: 19200,E,8,1

Important note:

If you cannot communicate with your PLC, check after setting the CommTxHoldRTSWhileTransmitting and CommTxHoldRTSWhileReceiving properties both to On.

2.2. Supported devices

This driver can communicate with these devices, but is not necessarily limited to this list:

- MITSUBISHI A-Series PLCs.
- MITSUBISHI A61PEU Controllers
- MITSUBISHI A62PEU Controllers
- MITSUBISHI A61P-UL Controllers
- MITSUBISHI A273UHCPU Controllers
- MITSUBISHI A273UHCPU-S3 Controllers
- MITSUBISHI A272B Controllers
- MITSUBISHI A278B Controllers
- MITSUBISHI A273EX Controllers
- MITSUBISHI A278LX Controllers
- MITSUBISHI MR-HENC Controllers
- MITSUBISHI A171SHCPUN Controllers
- MITSUBISHI A172SHCPUN Controllers
- MITSUBISHI A173UHCPU(-S1) Controllers
- MITSUBISHI A172B Controllers
- MITSUBISHI A175B Controllers
- MITSUBISHI A178B Controllers
- MITSUBISHI A178B-S1/S2/S3 Controllers
- MITSUBISHI A172SENC Controllers

3. Command list

3.1. Read Words of type TN, CN, D, R or W

Description of this command:

Reads a group of consecutive words of type TN (timer current values), CN (counter current values), D (data registers), R (file registers) or W (link registers) starting at a given point address.

Type of data handled by this command:

Analog Input

Number of points accepted by this command:

1-64

Meaning of the DriverP0 parameter:

Identifies the station number to be accessed (0-31)

Meaning of the DriverP1 parameter:

Identifies the PLC in the MELSECNET/H, MELSECNET/10 to be accessed, as explained below:

- 255 for Stations connected to an external device (local station) or for Stations connected to an external connection station by multidrop link.
- 1 to 64 for Station on the MELSECNET/H, MELSECNET 10 (excluding 1, 2 above) or for Remote master station on the MELSECNET/H (When an external device is connected to the Q series C24 in the remote I/O station).
- 0 can be designated when accessing the control station.

Meaning of the DriverP2 parameter:

Specifies the type of CPU:

- 0 for A CPU
- 1 for AnA/AnU CPU

Meaning of the DriverP3 parameter:

Specifies the message wait time (0-150), in milliseconds.

Meaning of the DriverP4 parameter:

Specifies the messages format:

- 0 = 1C Frame Format 1
- 1 = 1C Frame Format 4

Meaning of the DriverP6 parameter:

Specifies the address of the first word to be read. Valid addresses for A CPUs are:

- TN000 to TN255 (timer current values)

- CN000 to CN255 (counter current values)
- D0000 to D1023 (data registers)
- R0000 to R8191 (file registers)
- W0000 to W03FF (link registers) (*) Valid addresses for AnA/AnU CPUs are:
- TN00000 to TN02047 (timer current values)
- CN00000 to CN01023 (counter current values)
- D000000 to D008191 (data registers)
- R000000 to R008191 (file registers)
- W000000 to W001FFF (link registers) (*)

(*) Hexadecimal notation

Values that are returned:

Value in PointValue (0) = First word value (0-65535)

Value in PointValue (1) = Second word value (0-65535) .

Value in PointValue (DriverNumPoints-1) = Last word value (0-65535)

3.2. Read Bits of type X, Y, M, TS, TC, CS or CC

Description of this command:

Reads a group of consecutive bits of type X (inputs), Y (outputs), M (internal relays), TS (timer contacts), TC (timer coils), CS (counter contacts) or CC (counter coils), starting at a given point address.

Type of data handled by this command:

Digital Input

Number of points accepted by this command:

1-256

Meaning of the DriverP0 parameter:

Identifies the station number to be accessed (0-31)

Meaning of the DriverP1 parameter:

Identifies the PLC in the MELSECNET/H, MELSECNET/10 to be accessed, as explained below:

- 255 for Stations connected to an external device (local station) or for Stations connected to an external connection station by multidrop link.
- 1 to 64 for Station on the MELSECNET/H, MELSECNET 10 (excluding 1, 2 above) or for Remote master station on the MELSECNET/H (When an external device is connected to the Q series C24 in the remote I/O station).
- 0 can be designated when accessing the control station.

Meaning of the DriverP2 parameter:

Specifies the type of CPU:

- 0 for A CPU
- 1 for AnA/AnU CPU

Meaning of the DriverP3 parameter:

Specifies the message wait time (0-150), in milliseconds.

Meaning of the DriverP4 parameter:

Specifies the messages format:

- 0 = 1C Frame Format 1
- 1 = 1C Frame Format 4

Meaning of the DriverP6 parameter:

Specifies the address of the first bit to be read. Valid addresses for A CPUs are:

- X0000 to X07FF (inputs) (*)
- Y0000 to Y07FF (outputs) (*)
- M0000 to M2047 (internal relays)
- TS000 to TS255 (timer contacts)
- TC000 to TC255 (timer coils)
- CS000 to CS255 (counter contacts)
- CC000 to CC255 (counter coils) Valid addresses for AnA/AnU CPUs are:
- X000000 to X001FFF (inputs) (*)
- Y000000 to Y001FFF (outputs) (*)
- M000000 to M008191 (internal relays)
- TS00000 to TS02047 (timer contacts)
- TC00000 to TC02047 (timer coils)
- CS00000 to CS01023 (counter contacts)
- CC00000 to CC01023 (counter coils)

(*) Hexadecimal notation

Values that are returned:

Value in PointValue (0) = First bit status (0 or 1)

Value in PointValue (1) = Second bit status (0 or 1) .

Value in PointValue (DriverNumPoints-1) = Last bit status (0 or 1)

3.3. Write Words of type TN, CN, D, R or W

Description of this command:

Writes a group of consecutive words of type TN (timer current values), CN (counter current values), D (data registers), R (file registers) or W (link registers) starting at a given point address.

Type of data handled by this command:

Analog Output

Number of points accepted by this command:

1-64

Meaning of the DriverP0 parameter:

Identifies the station number to be accessed (0-31)

Meaning of the DriverP1 parameter:

Identifies the PLC in the MELSECNET/H, MELSECNET/10 to be accessed, as explained below:

- 255 for Stations connected to an external device (local station) or for Stations connected to an external connection station by multidrop link.
- 1 to 64 for Station on the MELSECNET/H, MELSECNET 10 (excluding 1, 2 above) or for Remote master station on the MELSECNET/H (When an external device is connected to the Q series C24 in the remote I/O station).
- 0 can be designated when accessing the control station.

Meaning of the DriverP2 parameter:

Specifies the type of CPU:

- 0 for A CPU
- 1 for AnA/AnU CPU

Meaning of the DriverP3 parameter:

Specifies the message wait time (0-150), in milliseconds.

Meaning of the DriverP4 parameter:

Specifies the messages format:

- 0 = 1C Frame Format 1
- 1 = 1C Frame Format 4

Meaning of the DriverP6 parameter:

Specifies the address of the first word to be written. Valid addresses for A CPUs are:

- TN000 to TN255 (timer current values)
- CN000 to CN255 (counter current values)
- D0000 to D1023 (data registers)
- R0000 to R8191 (file registers)
- W0000 to W03FF (link registers) (*) Valid addresses for AnA/AnU CPUs are:
- TN00000 to TN02047 (timer current values)
- CN00000 to CN01023 (counter current values)
- D000000 to D008191 (data registers)
- R000000 to R008191 (file registers)
- W000000 to W001FFF (link registers) (*)

(*) Hexadecimal notation

Values that are sent:

Value in PointValue (0) = Value for first word (0-65535)

Value in PointValue (1) = Value for second word (0-65535) .

Value in PointValue (DriverNumPoints-1) = Value for last word (0-65535)

3.4. Write Bits of type X, Y, M, TS, TC, CS or CC

Description of this command:

Writes a group of consecutive bits of type X (inputs), Y (outputs), M (internal relays), TS (timer contacts), TC (timer coils), CS (counter contacts) or CC (counter coils), starting at a given point address.

Type of data handled by this command:

Digital Output

Number of points accepted by this command:

1-256

Meaning of the DriverP0 parameter:

Identifies the station number to be accessed (0-31)

Meaning of the DriverP1 parameter:

Identifies the PLC in the MELSECNET/H, MELSECNET/10 to be accessed, as explained below:

- 255 for Stations connected to an external device (local station) or for Stations connected to an external connection station by multidrop link.
- 1 to 64 for Station on the MELSECNET/H, MELSECNET 10 (excluding 1, 2 above) or for Remote master station on the MELSECNET/H (When an external device is connected to the Q series C24 in the remote I/O station).
- 0 can be designated when accessing the control station.

Meaning of the DriverP2 parameter:

Specifies the type of CPU:

- 0 for A CPU
- 1 for AnA/AnU CPU

Meaning of the DriverP3 parameter:

Specifies the message wait time (0-150), in milliseconds.

Meaning of the DriverP4 parameter:

Specifies the messages format:

- 0 = 1C Frame Format 1
- 1 = 1C Frame Format 4

Meaning of the DriverP6 parameter:

Specifies the address of the first bit to be written. Valid addresses for A CPUs are:

- X0000 to X07FF (inputs) (*)
- Y0000 to Y07FF (outputs) (*)
- M0000 to M2047 (internal relays)
- TS000 to TS255 (timer contacts)
- TC000 to TC255 (timer coils)
- CS000 to CS255 (counter contacts)

- CC0000 to CC255 (counter coils) Valid addresses for AnA/AnU CPUs are:
- X000000 to X001FFF (inputs) (*)
- Y000000 to Y001FFF (outputs) (*)
- M000000 to M008191 (internal relays)
- TS00000 to TS02047 (timer contacts)
- TC00000 to TC02047 (timer coils)
- CS00000 to CS01023 (counter contacts)
- CC00000 to CC01023 (counter coils)

(*) Hexadecimal notation

Values that are sent:

Value in PointValue (0) = Status for first bit (0 or 1)

Value in PointValue (1) = Status for second bit (0 or 1) .

Value in PointValue (DriverNumPoints-1) = Status for last bit (0 or 1)

4. Appendices

4.1. Error messages

The following list shows all the possible error messages that can be returned by the protocol driver during a failed communication in the 'DriverStatus' property.

This list does not include some error messages that can be returned by the activex component while attempting to establish a connection.

- [1005] DRIVER (Internal): Invalid driver stage
- [1300] PROTOCOL (Timeout): No answer
- [1433] PROTOCOL (Format): Validation error in device response
- [2204] CONFIG (NumValues): Too many values (max=256)
- [2230] CONFIG (NumValues): Too many values (max=64)
- [3015] CONFIG (P0): Invalid device address (0-31)
- [3506] CONFIG (P1): Invalid address
- [4136] CONFIG (P2): Invalid CPU type
- [4591] CONFIG (P3): Invalid message wait time (0-150)
- [5039] CONFIG (P4): Invalid messages format
- [6008] CONFIG (P6): Invalid Address

4.2. Keywords list

The following list shows a set of words directly related to this driver.

"A-Compatible, A-Series, A171SHCPUN, A172B, A172SENC, A172SHCPUN, A173UHCPU(-S1, A175B, A178B, A178B-S1/S2/S3, A272B, A273EX, A273UHCPU, A273UHCPU-S3, A278B, A278LX, A61P-UL, A61PEU, A62PEU, Controllers, Melsec-Q, MITSUBISHI, MR-HENC, PLCs."