

Contrex Device Driver Help

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Contrex Device Driver Help

Help version 1.005

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Overview

The Contrex Device Driver was designed specifically for use with 32 bit OPC Server products running on Intel microprocessor based computers. It is intended for use with Contrex CX-1000 devices. Refer to the Server Help documentation for operating system (OS) requirements.

Device Setup

Supported Devices

Contrex CX-1000 Motion Controller

Communication Protocol

CX-Series Serial Communications Binary Data-Link Protocol.

Supported Communication Parameters

Baud Rate: 300, 600, 1200, 2400, 9600*, or 19200

Parity: None

Data Bits: 8

Stop Bits: 1

*This is the default setting.

Ethernet Encapsulation

This driver supports Ethernet Encapsulation. Ethernet Encapsulation allows the driver to communicate with serial devices attached to an Ethernet network using a terminal server. Ethernet Encapsulation mode is invoked by selecting it from the COM ID dialog in Channel Properties.

*Not all devices support listed configurations.

Device IDs

Valid Device IDs range from 0 to 99.

Device ID 0 is used to identify broadcast messages. A device topic can be configured within the server that uses a Device ID of station 0. All tags and data associated with this broadcast topic will be treated as Write Only. By defining a broadcast topic in the OPC Server project you will be able to issue CX-1000 commands to multiple controllers simultaneously.

CRC Enabled

When CRC is enabled the Contrex driver will append a 16-bit CRC value at the end of each data transmission. The driver will also calculate and compare the 16-bit CRC value received from the controller for any errors. Determine if

CRC is enabled on the controller and set this setting accordingly.

Precision

Set the default precision to use when writing Float data to the device.

For example, when writing 50.02 from the client, the Float value received by the server could be 50.019999. The driver needs to know the precision that should be used for this value.

Solution 1: Append a bit number, representing the precision, to the address. A bit number of three would send the previous example as 50.019 with a precision of 3.

Solution 2: Set a master precision value between 0 and 9 (under Device Properties). This will force the precision on all Float writes to be the value of the master precision. Setting this to 3, would not require users to append a bit number (as in the first solution).

Note: The master precision can not be overridden by appending a bit number to any address as described above. **See Also:** [Address Descriptions](#).

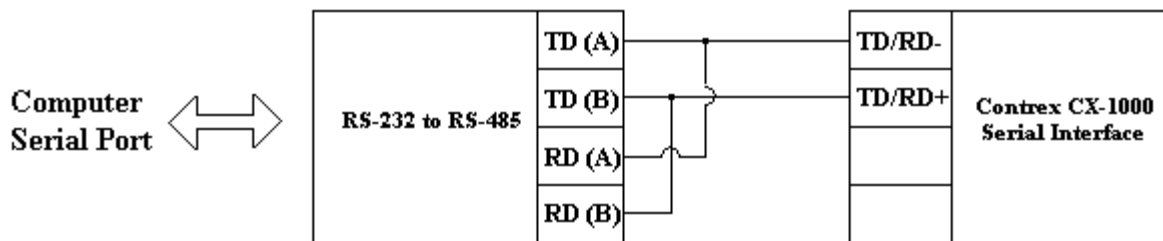
Cable Connections

We suggest using a high quality manufactured RS232/485 converter when communicating with the Contrex CX-1000. This converter will automatically handle the operation of the 485 line drivers.

Flow Control

When using an RS232/RS485 converter, the type of flow control that is required will depend upon the needs of the converter. Some converters do not require any flow control and others will require RTS flow. Consult the documentation of the converter to determine what its flow requirements are.

The following diagram illustrates an RS-232 to RS-485 cable diagram using this converter.



Modem Setup

This driver supports modem functionality. For more information, please refer to the topic "Modem Support" in the OPC Server Help documentation.

Data Types Description

Data Type	Description
Boolean	Single bit
DWord	Unsigned 32 bit value bit 0 is the low bit bit 31 is the high bit
Long	Signed 32 bit value bit 0 is the low bit bit 30 is the high bit bit 31 is the sign bit
Float	32 bit Floating point value.

	The driver interprets two consecutive registers as a Floating point value by making the second register the high word and the first register the low word.
String	Null terminated character array

Address Descriptions

The Contrex protocol supports the following addresses. The default data types for dynamically defined tags are shown in **bold**.

Memory	Syntax	Data Type	Access*****
Monitor Parameters	MP01.bb-MP99.bb* MPxx.00-MPxx.31	Boolean, Long , DWord, Float Boolean	Read Only
Control Parameters	CP101.bb-CP999.bb* CPxx.00-CPxx.31	Boolean, Long , DWord, Float** Boolean	Read/Write
Custom Engineering Units	EU	String	Read/Write
Control Commands	CL.<command mnemonic>***	Boolean	Write Only
Constant Data Table	CT001.<element>- CT999.<element>****	Long, Float String****	Read Only

*On DWord or Long type,s an optional .bb (dot bit) can be appended to the address to reference a bit in a particular value. The valid ranges for the optional bit is 0-31. Float types do not support bit operations (except in the special cases of CPxxx.xx and CTxxx.<element>). Boolean types require a bit number.

**For control parameters: If a Float address has a bit appended (0 to 9 allowed), this will represent the Floating precision on any writes to the device. For more information on Floating point precision, refer to [Device Setup](#).

***Valid Command Mnemonics (to execute these commands write a 1 to the address):

Mnemonic	Description
FS	F-Stop
RS	R-Stop
HS	H-Stop
RUN	Run
JF	Jog Forward
JR	Jog Reverse
JS	Jog Stop
RI	Reset Integral
PF	Preset Feedback Position
PL	Preset Lead Position
RPE	Reset Position Error
PFL	Preset Feedback & Lead Position
PFLR	Preset Feedback & Lead Position & Reset Position Error
NSR	Negate Scaled Reference
BR	Bypass Ramp
SR	Stop Ramp
OL	Open Loop
SI	Stop Integral

****Valid Constant Data Table Elements:

Element	Description	
PT	Parameter Title	(Data Type must be String)
MIN	Minimum Value	(Data Type must be Float)

MAX	Maximum Value	(Data Type must be Float)
DEF	Default Value	(Data Type must be Float)
FL	Field Length	(Data Type must be Long)

*****Broadcast Messages: When a topic is defined for Device ID 0, the CX-1000 driver will allow you to send data and command parameters to all CX-1000 controllers on the network simultaneously. When using a broadcast topic, all memory types that normally supported Read/Write operation become Write Only. If intending to write a value of 100 to CP101 on every controller simultaneously, users can define a device topic as Device ID 0. The value of CP101 will not be able to be read back using the broadcast topic.

Examples

1. To send the Jog Forward command to the controller use the syntax: CL.JF and write a 1 to the address.
2. To Monitor the alarm conditions for the STD Alarms (MP54), reference the data as Boolean data:

MP54.0-Max FB Alarm
 MP54.1-Max ACC/DEC
 MP54.2-No Resp Time
 MP54.3-Max F12 Pos
 MP54.4-Lo Pwr Alm
 MP54.5-Max FI1Hz
 MP54.6-Max FI2 Hz
 MP54.7-At Max CO_Sig

Note: For more information on alarm conditions, refer to the CX-1000 documentation.

3. To view the constant data table element Minimum Value for CP250, use the syntax CT250.MIN.

Note: The actual number of addresses of each type depends on the Contrex device in use. For address ranges, refer to the specific device's documentation.

Error Descriptions

The following error/warning messages may be generated. Click on the link for a description of the message.

Address Validation

[Missing address](#)

[Device address '<address>' contains a syntax error](#)

[Address '<address>' is out of range for the specified device or register](#)

[Device address '<address>' is not supported by model '<model name>'](#)

[Data Type '<type>' is not valid for device address '<address>'](#)

[Device address '<address>' is Read Only](#)

Serial Communications

[COMn does not exist](#)

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[Communications error on COMn \[<error mask>\]](#)

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[Device '<device name>' is not responding](#)

Device Specific Messages

[Unable to write to '<address>' on device '<device name>'](#)

[Deactivating Tag '<address>' on device '<device name>'. Contrex Error \(<error code>\) <error description>](#)

Address Validation

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[Data Type '<type>' is not valid for device address '<address>'](#)

[Device address '<address>' is Read Only](#)

Missing address

Error Type:

Warning

Possible Cause:

A tag address that has been specified dynamically has no length.

Solution:

Re-enter the address in the client application.

Device address '<address>' contains a syntax error

Error Type:

Warning

Possible Cause:

A tag address that has been specified dynamically contains one or more invalid characters.

Solution:

Re-enter the address in the client application.

Address '<address>' is out of range for the specified device or register

Error Type:

Warning

Possible Cause:

A tag address that has been specified dynamically references a location that is beyond the range of supported locations for the device.

Solution:

Verify the address is correct; if it is not, re-enter it in the client application.

Device address '<address>' is not supported by model '<model name>'

Error Type:

Warning

Possible Cause:

A tag address that has been specified dynamically references a location that is valid for the communications protocol but not supported by the target device.

Solution:

Verify that the address is correct; if it is not, re-enter it in the client application. Also verify that the selected model

name for the device is correct.

Data Type '<type>' is not valid for device address '<address>'

Error Type:

Warning

Possible Cause:

A tag address that has been specified dynamically has been assigned an invalid data type.

Solution:

Modify the requested data type in the client application.

Device address '<address>' is Read Only

Error Type:

Warning

Possible Cause:

A tag address that has been specified dynamically has a requested access mode that is not compatible with what the device supports for that address.

Solution:

Change the access mode in the client application.

Serial Communications

The following error/warning messages may be generated. Click on the link for a description of the message.

Serial Communications

[COMn does not exist](#)

[Error opening COMn](#)

[COMn is in use by another application](#)

[Unable to set comm parameters on COMn](#)

[Communications error on COMn \[<error mask>\]](#)

COMn does not exist

Error Type:

Fatal

Possible Cause:

The specified COM port is not present on the target computer.

Solution:

Verify that the proper COM port has been selected.

Error opening COMn

Error Type:

Fatal

Possible Cause:

The specified COM port could not be opened due to an internal hardware or software problem on the target computer.

Solution:

Verify that the COM port is functional and may be accessed by other Windows applications.

COMn is in use by another application

Error Type:

Fatal

Possible Cause:

The serial port assigned to a device is being used by another application.

Solution:

1. Verify that the correct port has been assigned to the channel.
2. Verify that only one copy of the current project is running.

Unable to set comm parameters on COMn

Error Type:

Fatal

Possible Cause:

The serial parameters for the specified COM port are not valid.

Solution:

Verify the serial parameters and make any necessary changes.

Communications error on COMn [<error mask>]

Error Type:

Serious

Error Mask Definitions:

B= Hardware break detected.

F= Framing error.

E= I/O error.

O= Character buffer overrun.

R= RX buffer overrun.

P= Received byte parity error.

T= TX buffer full.

Possible Cause:

1. The serial connection between the device and the host PC is bad.
2. The communications parameters for the serial connection are incorrect.

Solution:

1. Verify the cabling between the PC and the device.
2. Verify that the specified communications parameters match those of the device.

Device Status Messages

The following error/warning messages may be generated. Click on the link for a description of the message.

Device Status Messages

[Device '<device name>' is not responding](#)

Device '<device name>' is not responding

Error Type:

Serious

Possible Cause:

1. The serial connection between the device and the host PC is broken.
2. The communications parameters for the serial connection are incorrect.
3. The named device may have been assigned an incorrect Network ID.

Solution:

1. Verify the cabling between the PC and the device.
2. Verify that the specified communications parameters match those of the device.
3. Verify that the Network ID given to the named device matches that of the actual device.

Device Specific Messages

The following error/warning messages may be generated. Click on the link for a description of the message.

Device Specific Messages

[Unable to write to '<address>' on device '<device name>'](#)

[Deactivating Tag '<address>' on device '<device name>.' Contrex Error \(<error code>\) <error description>](#)

Unable to write to '<address>' on device '<device name>.' Contrex Error (<error code>) <error description>

Error Type:

Serious

Possible Cause:

1. The serial connection between the device and the host PC is broken.
2. The communications parameters for the serial connection are incorrect.
3. The named device may have been assigned an incorrect Network ID.
4. The address being written to is invalid or the data is out of range.

Solution:

1. Verify the cabling between the PC and the device.
2. Verify that the specified communications parameters match those of the device.
3. Verify that the Network ID given to the named device matches that of the actual device.
4. Verify that the address is valid in the controller. Use the Contrex Error description to determine the cause of the error. An example error description is: "Out of Range." In this case, users should check to see if the data sent to the device is between the allowable minimum and maximum limits.

Deactivating Tag '<address>' on device '<device name>.' Contrex Error (<error code>) <error description>

Error Type:

Serious

Possible Cause:

An attempt has been made to reference a nonexistent location in the specified device. The driver will deactivate the tag.

Solution:

Verify the tags assigned to addresses in the specified range on the device and eliminate ones that reference invalid locations. Use the Contrex Error Description returned by the driver to determine the cause of the error.

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