

Yokogawa HR Driver

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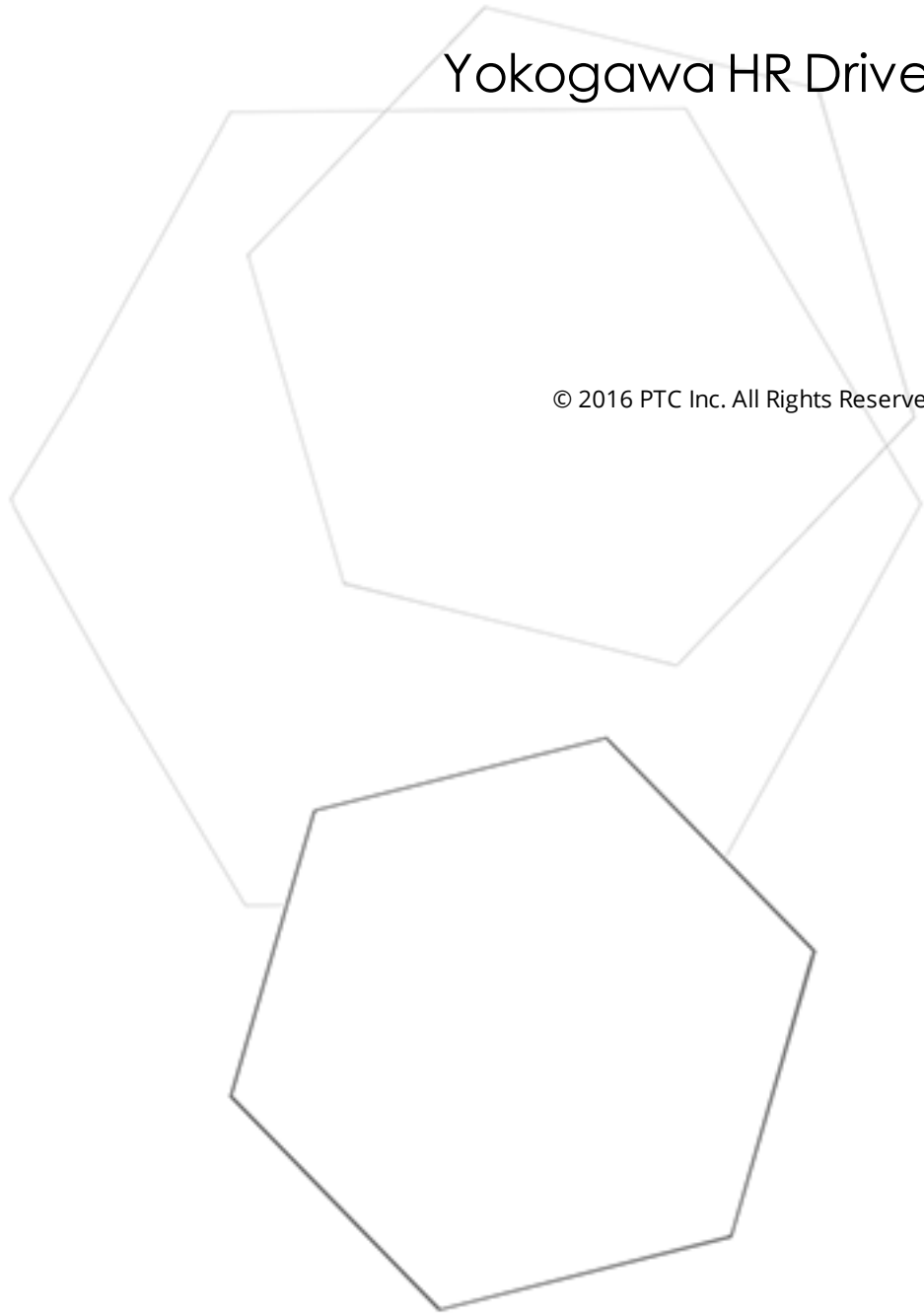


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Yokogawa HR Driver

Help version 1.015

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Overview

The Yokogawa HR Driver provides a reliable way to connect Yokogawa HR2400 Serial devices to OPC client applications; including HMI, SCADA, Historian, MES, ERP, and countless custom applications. It is intended for use with Yokogawa Data Acquisition and Data Recorder devices that support RS232 or RS422 communications.

Device Setup

Supported Yokogawa Devices

HR2400 (10CH)
HR2400 (20CH)
HR2400 (30CH)

Supported Communication Parameters

Baud Rate: 300, 600, 1200, 2400, 9600
Parity: None, Even or Odd
Data Bits: 8
Stop Bits: 1 or 2
Flow Control: None, RTS or DTR. Software handshaking is not available.

Note: This driver makes use of binary data formatting when reading information from Yokogawa devices. This requires that a data bit setting of 8 be used.

RS-232 and RS-422/485 Operation

Yokogawa HR2400 Serial devices can support RS-232 or RS-422/485 operation. The mode used depends on the OPC server project's configuration.

If intending to connect to a HR2400 Serial device using RS-232, select a Device ID of zero (0). This tells the driver to use the RS-232 mode for communications. If intending to use either RS-422 or RS-485 communications, select a Device ID for each station that is between 1 and 16 for RS-422 and 1 and 31 for RS-485. When using RS-232, only configure one device on the channel.

Device Configuration Properties

Special Data Handling

This setting allows the driver to be configured to return specific data values for numerical out of range and error conditions returned from the device. Special Data Handling options are **None**, **+INF** and **-INF**. If set to None, special data values will be returned with the actual data value received from the device. For example, the data value of a measuring channel Over Range would be returned as 32,767 and the data value of a math channel Over Range would be returned as 2,147,450,879. If set to +INF, special data values will be returned as a numerical representation of positive infinity (#INF), with the exception of an Under Range condition that is always returned as negative infinity. When Special Data Handling is set to -INF, special data values will be returned as a numerical representation of negative infinity (-#INF), with the exception of an Over Range condition that is always returned as positive infinity.

Start Math on Start

When Enable is specified, this property will inform the driver to send a command to the device at communication startup that will start the math computation.

Date and Time

This property specifies the origin of the data value of the Date and Time data types which represent the date and time of the latest data. Date and Time options are **Device Time** and **System Time**. If Device Time is selected, the Date and Time tags will return the date and time read from the device. This date and time represents the date and time that the latest data was measured or computed based on the internal device clock. If System Time is selected, the Date and Time tags will return the date and time that the requested data was returned from the device based on the PC system clock.

Date Format

This property specifies the format of the return string for the Date data type. Date formats can be specified as **MM/DD/YY** (month/day/year), **YY/MM/DD** (year/month/day) or **DD/MM/YY** (day/month/year).

Set Clock on Start

When Enable is specified, this property instructs the driver to send a command to the device at communication startup that will set the device clock to the date and time settings of the system clock.

Data Types Description

Data Type	Description
Boolean	Single bit
Byte	Unsigned 8 bit value
Word	Unsigned 16 bit value
DWord	Unsigned 32 bit value
Short	Signed 16 bit value
Float	32 bit floating point value
Double	64 bit floating point value
String	Null terminated ASCII string

Address Descriptions

Address specifications vary depending on the model in use. Select a link from the following list to obtain specific address information for the model of interest.

[HR2400 \(10CH\) Addressing](#)

[HR2400 \(20CH\) Addressing](#)

[HR2400 \(30CH\) Addressing](#)

HR2400 (10CH) Addressing

The driver supports the following addresses for this device. The default data type for each address type is shown in **bold**.

Measuring and Math Channels

Address Type	Format	Range	Data Types	Access
Process Value of Channel	CHxx or CHxx.PV	01-10, 31-60	Double , Float	Read Only
Alarm Summary of Channel	CHxx.Alarm	01-10, 31-60	DWord , Short, Word, Byte	Read Only
Alarm Level1 Status of Channel	CHxx.Alarm1	01-10, 31-60	Short , Word, Byte	Read Only
Alarm Level2 Status of Channel	CHxx.Alarm2	01-10, 31-60	Short , Word, Byte	Read Only
Alarm Level3 Status of Channel	CHxx.Alarm3	01-10, 31-60	Short , Word, Byte	Read Only
Alarm Level4 Status of Channel	CHxx.Alarm4	01-10, 31-60	Short , Word, Byte	Read Only
Alarm Level5 Status of Channel	CHxx.Alarm5	01-10, 31-60	Short , Word, Byte	Read Only
Alarm Level6 Status of Channel	CHxx.Alarm6	01-10, 31-60	Short , Word, Byte	Read Only
Level1 Alarm Setpoint*	CHxx.ASP1	01-10, 31-60	Double , Float	Read Only
Level2 Alarm Setpoint*	CHxx.ASP2	01-10, 31-60	Double , Float	Read Only
Level3 Alarm Setpoint*	CHxx.ASP3	01-10, 31-60	Double , Float	Read Only
Level4 Alarm Setpoint*	CHxx.ASP4	01-10, 31-60	Double , Float	Read Only
Level5 Alarm Setpoint*	CHxx.ASP5	01-10, 31-60	Double , Float	Read Only
Level6 Alarm Setpoint*	CHxx.ASP6	01-10, 31-60	Double , Float	Read Only
Upper Scale Value of Channel*	CHxx.scale_Hi	01-10, 31-60	Double , Float	Read Only
Lower Scale Value of Channel*	CHxx.scale_Lo	01-10, 31-60	Double , Float	Read Only
Unit String of Channel*	CHxx.unit	01-10, 31-	String	Read

		60		Only
Tagname of Channel*	CHxx.tag	01-10, 31-60	String	Read Only
Status of Channel*	CHxx.status	01-10, 31-60	String	Read Only
Lowest Measuring Channel*	CH.Low		Short, Word, Byte	Read Only
Highest Measuring Channel*	CH.High		Short, Word, Byte	Read Only
Lowest Math Channel*	CHA.Low		Short, Word, Byte	Read Only
Highest Math Channel*	CHA.High		Short, Word, Byte	Read Only

*Data associated with these addresses are read from the device only at the start of a communications session. Once read, the values will not be refreshed until the server has been restarted or the "Reset" tag has been invoked. To invoke a reset, a non-zero value must be written to the Reset tag. Once the Reset tag has been invoked, the driver will reinitialize all startup data from the device.

Alarm Setpoints

Data values for Alarm Setpoints that are undefined in the device will be returned as +INF.

Scales

Data values for Scale_Hi and Scale_Lo for channels that are skipped will be returned as +INF.

Tag Names

For devices that do not support tag names and channels that have unspecified tag names, the driver will construct an internal tag name based on the channel number. For example, the tag name of address 'CH01' will be returned as 'CH01'.

General Device Data

Address Type	Format	Range	Data Types	Access
Date of Last Data	Date		String	Read Only
Time of Last Data	Time		String	Read Only
Model Name of Device*	Model		String	Read Only
Math Communication Data*	CDxx	01-30	Float	Write Only
Control Math Execution	MathControl		Short, Word, Byte	Write Only
Reset Alarms	AlarmReset		Boolean	Write Only
Direct Reloading of Configuration	Reset		Boolean	Write Only

Math Communication Data

The CD address type is only valid for devices equipped with the math option. Write operations to CD addresses for non-math equipped devices will return an error.

Model Name of Device

The Model address type will have a string value of 'HR2400' for all models.

Control Math Execution

The MathControl address type is only available for devices equipped with the math option. Write operations to the MathControl tag for non-math equipped devices will return an error.

Note 1: The actual number of addresses available for of each type depends on the configuration of the Yokogawa device. If the driver finds at Runtime that an address is not present in the device, it will post an error message and remove the tag from its scan list.

Note 2: Addresses that have Write Only access are assigned a default access of Read/Write. However, data values are unreadable for these addresses and the associated tags are not included in the scan list. The current data value for these tags will always be 0 for numeric data types and null string for string data types.

HR2400 (20CH) Addressing

The driver supports the following addresses for this device. The default data type for each address type is shown in **bold**.

Measuring and Math Channels

Address Type	Format	Range	Data Types	Access
Process Value of Channel	CHxx or CHxx.PV	01-20, 31-60	Double , Float	Read Only
Alarm Summary of Channel	CHxx.Alarm	01-20, 31-60	DWord , Short, Word, Byte	Read Only
Alarm Level1 Status of Channel	CHxx.Alarm1	01-20, 31-60	Short , Word, Byte	Read Only
Alarm Level2 Status of Channel	CHxx.Alarm2	01-20, 31-60	Short , Word, Byte	Read Only
Alarm Level3 Status of Channel	CHxx.Alarm3	01-20, 31-60	Short , Word, Byte	Read Only
Alarm Level4 Status of Channel	CHxx.Alarm4	01-20, 31-60	Short , Word, Byte	Read Only
Alarm Level5 Status of Channel	CHxx.Alarm5	01-20, 31-60	Short , Word, Byte	Read Only
Alarm Level6 Status of Channel	CHxx.Alarm6	01-20, 31-60	Short , Word, Byte	Read Only
Level1 Alarm Setpoint*	CHxx.ASP1	01-20, 31-60	Double , Float	Read Only
Level2 Alarm Setpoint*	CHxx.ASP2	01-20, 31-60	Double , Float	Read Only
Level3 Alarm Setpoint*	CHxx.ASP3	01-20, 31-60	Double , Float	Read Only
Level4 Alarm Setpoint*	CHxx.ASP4	01-20, 31-60	Double , Float	Read Only
Level5 Alarm Setpoint*	CHxx.ASP5	01-20, 31-60	Double , Float	Read Only
Level6 Alarm Setpoint*	CHxx.ASP6	01-20, 31-60	Double , Float	Read Only
Upper Scale Value of Channel*	CHxx.scale_Hi	01-20, 31-60	Double , Float	Read Only
Lower Scale Value of Channel*	CHxx.scale_Lo	01-20, 31-60	Double , Float	Read Only
Unit String of Channel*	CHxx.unit	01-20, 31-	String	Read

Address Type	Format	Range	Data Types	Access
		60		Only
Tagname of Channel*	CHxx.tag	01-20, 31-60	String	Read Only
Status of Channel*	CHxx.status	01-20, 31-60	String	Read Only
Lowest Measuring Channel*	CH.Low		Short , Word, Byte	Read Only
Highest Measuring Channel*	CH.High		Short , Word, Byte	Read Only
Lowest Math Channel*	CHA.Low		Short , Word, Byte	Read Only
Highest Math Channel*	CHA.High		Short , Word, Byte	Read Only

*Data associated with these addresses are read from the device only at the start of a communications session. Once read, the values will not be refreshed until the server has been restarted or the "Reset" tag has been invoked. To invoke a reset, a non-zero value must be written to the Reset tag. Once the Reset tag has been invoked, the driver will reinitialize all startup data from the device.

Alarm Setpoints

Data values for Alarm Setpoints that are undefined in the device will be returned as +INF.

Scales

Data values for Scale_Hi and Scale_Lo for channels that are skipped will be returned as +INF.

Tag Names

For devices that do not support tag names and channels that have unspecified tag names, the driver will construct an internal tag name based on the channel number. For example, the tag name of address 'CH01' will be returned as 'CH01'.

General Device Data

Address Type	Format	Range	Data Types	Access
Date of Last Data	Date		String	Read Only
Time of Last Data	Time		String	Read Only
Model Name of Device*	Model		String	Read Only
Math Communication Data*	CDxx	01-30	Float	Write Only
Control Math Execution	MathControl		Short , Word, Byte	Write Only
Reset Alarms	AlarmReset		Boolean	Write Only
Direct Reloading of Configuration	Reset		Boolean	Write Only

Math Communication Data

The CD address type is only valid for devices equipped with the math option. Write operations to CD addresses for non-math equipped devices will return an error.

Model Name of Device

The Model address type will have a string value of 'HR2400' for all models.

Control Math Execution

The MathControl address type is only available for devices equipped with the math option. Write operations to the MathControl tag for non-math equipped devices will return an error.

Note 1: The actual number of addresses available for of each type depends on the configuration of the Yokogawa device. If the driver finds at Runtime that an address is not present in the device, it will post an error message and remove the tag from its scan list.

Note 2: Addresses that have Write Only access are assigned a default access of Read/Write. However, data values are unreadable for these addresses and the associated tags are not included in the scan list. The current data value for these tags will always be 0 for numeric data types and null string for string data types.

HR2400 (30CH) Addressing

The driver supports the following addresses for this device. The default data type for each address type is shown in **bold**.

Measuring and Math Channels

Address Type	Format	Range	Data Types	Access
Process Value of Channel	CHxx or CHxx.PV	01-30, 31-60	Double , Float	Read Only
Alarm Summary of Channel	CHxx.Alarm	01-30, 31-60	DWord , Short, Word, Byte	Read Only
Alarm Level1 Status of Channel	CHxx.Alarm1	01-30, 31-60	Short , Word, Byte	Read Only
Alarm Level2 Status of Channel	CHxx.Alarm2	01-30, 31-60	Short , Word, Byte	Read Only
Alarm Level3 Status of Channel	CHxx.Alarm3	01-30, 31-60	Short , Word, Byte	Read Only
Alarm Level4 Status of Channel	CHxx.Alarm4	01-30, 31-60	Short , Word, Byte	Read Only
Alarm Level5 Status of Channel	CHxx.Alarm5	01-30, 31-60	Short , Word, Byte	Read Only
Alarm Level6 Status of Channel	CHxx.Alarm6	01-30, 31-60	Short , Word, Byte	Read Only
Level1 Alarm Setpoint*	CHxx.ASP1	01-30, 31-60	Double , Float	Read Only
Level2 Alarm Setpoint*	CHxx.ASP2	01-30, 31-60	Double , Float	Read Only
Level3 Alarm Setpoint*	CHxx.ASP3	01-30, 31-60	Double , Float	Read Only
Level4 Alarm Setpoint*	CHxx.ASP4	01-30, 31-60	Double , Float	Read Only
Level5 Alarm Setpoint*	CHxx.ASP5	01-30, 31-60	Double , Float	Read Only
Level6 Alarm Setpoint*	CHxx.ASP6	01-30, 31-60	Double , Float	Read Only
Upper Scale Value of Channel*	CHxx.scale_Hi	01-30, 31-60	Double , Float	Read Only
Lower Scale Value of Channel*	CHxx.scale_Lo	01-30, 31-	Double , Float	Read

Address Type	Format	Range	Data Types	Access
		60		Only
Unit String of Channel*	CHxx.unit	01-30, 31-60	String	Read Only
Tagname of Channel*	CHxx.tag	01-30, 31-60	String	Read Only
Status of Channel*	CHxx.status	01-30, 31-60	String	Read Only
Lowest Measuring Channel*	CH.Low		Short , Word, Byte	Read Only
Highest Measuring Channel*	CH.High		Short , Word, Byte	Read Only
Lowest Math Channel*	CHA.Low		Short , Word, Byte	Read Only
Highest Math Channel*	CHA.High		Short , Word, Byte	Read Only

*Data associated with these addresses are read from the device only at the start of a communications session. Once read, the values will not be refreshed until the server has been restarted or the "Reset" tag has been invoked. To invoke a reset, a non-zero value must be written to the Reset tag. Once the Reset tag has been invoked, the driver will reinitialize all startup data from the device.

Alarm Setpoints

Data values for Alarm Setpoints that are undefined in the device will be returned as +INF.

Scales

Data values for Scale_Hi and Scale_Lo for channels that are skipped will be returned as +INF.

Tag Names

For devices that do not support tag names and channels that have unspecified tag names, the driver will construct an internal tag name based on the channel number. For example, the tag name of address 'CH01' will be returned as 'CH01'.

General Device Data

Address Type	Format	Range	Data Types	Access
Date of Last Data	Date		String	Read Only
Time of Last Data	Time		String	Read Only
Model Name of Device*	Model		String	Read Only
Math Communication Data*	CDxx	01-30	Float	Write Only
Control Math Execution	MathControl		Short , Word, Byte	Write Only
Reset Alarms	AlarmReset		Boolean	Write Only
Direct Reloading of Configuration	Reset		Boolean	Write Only

Math Communication Data

The CD address type is only valid for devices equipped with the math option. Write operations to CD addresses for non-math equipped devices will return an error.

Model Name of Device

The Model address type will have a string value of 'HR2400' for all models.

Control Math Execution

The MathControl address type is only available for devices equipped with the math option. Write operations to the MathControl tag for non-math equipped devices will return an error.

Note 1: The actual number of addresses available for of each type depends on the configuration of the Yokogawa device. If the driver finds at Runtime that an address is not present in the device, it will post an error message and remove the tag from its scan list.

Note 2: Addresses that have Write Only access are assigned a default access of Read/Write. However, data values are unreadable for these addresses and the associated tags are not included in the scan list. The current data value for these tags will always be 0 for numeric data types and null string for string data types.

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](#)

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

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

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 '<channel name>' \[<error mask>\]](#)

Device Status Messages

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

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

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.

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.

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 COMN 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 '<channel name>' [<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 PLC device.
2. Verify that the specified communications parameters match those of the device.

Device '<device name>' is not responding

Error Type:

Serious

Possible Cause:

1. The connection between the device and the Host PC is broken.
2. The communication port specified is incorrect.
3. The response from the device took longer to receive than the amount of time specified in the "Request Timeout" device setting.

Solution:

1. Verify the cabling between the PC and the PLC device.
2. Verify that the specified communication parameters match those of the device.
3. Increase the Request Timeout setting so that the entire response can be handled.

Unable to write to '<address>' on device '<device name>'

Error Type:

Serious

Possible Cause:

1. The connection between the device and the Host PC is broken.
2. The named device may have been assigned an incorrect IP address.
3. The address specified may be Read Only or may not exist in the current device.

Solution:

1. Verify the cabling between the PC and the PLC device.
2. Verify the IP address given to the named device matches that of the actual device.
3. Check address availability for the device.

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