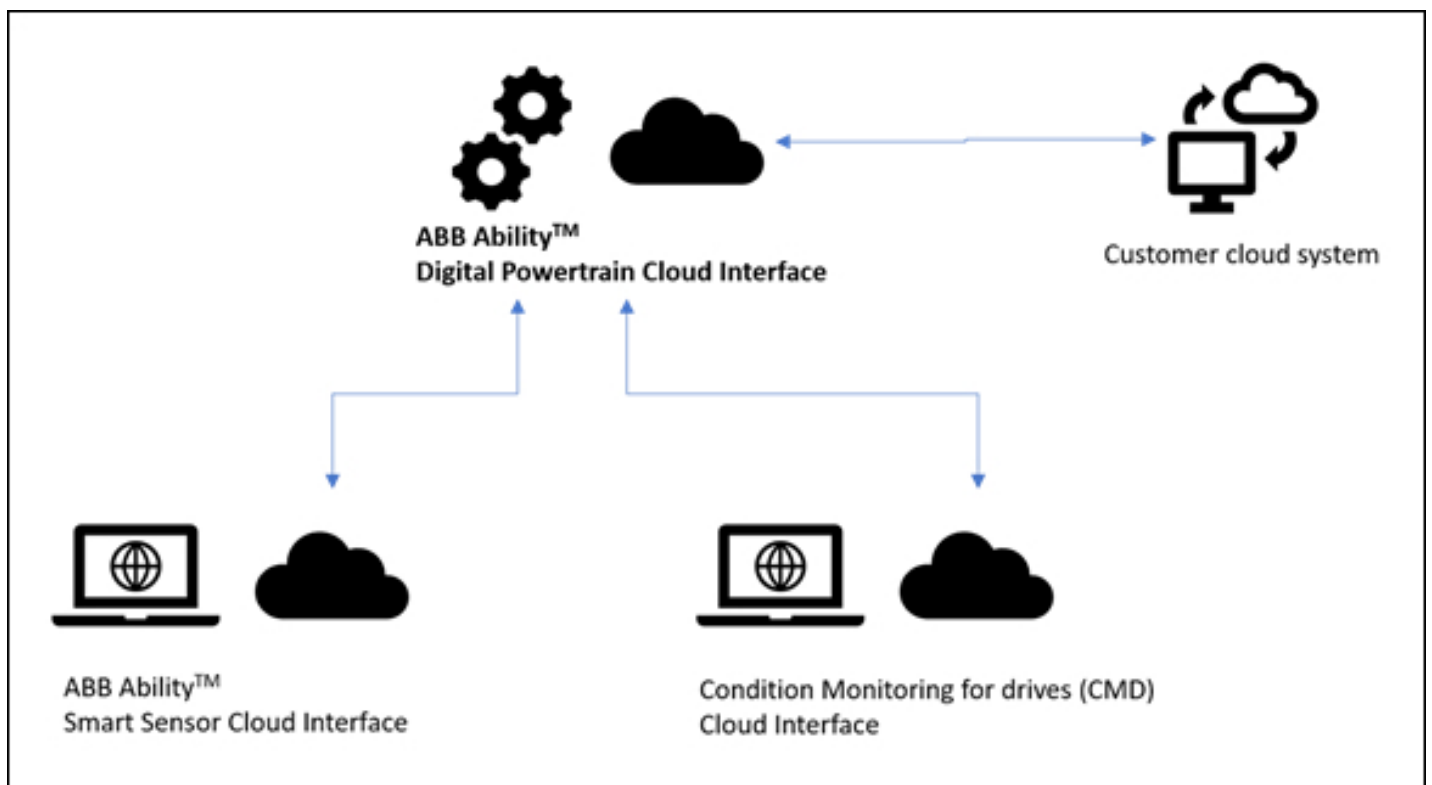


ABB DIGITAL SERVICES

Cloud Interface for ABB Ability™ Condition Monitoring for powertrains

Reference guide



Cloud Interface for ABB Ability™ Condition Monitoring for powertrains

Reference guide

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1

Introduction to the guide

Contents of this chapter

This chapter provides information about the guide, such as applicability, target audience and contents of this manual.

Purpose of this guide

This reference guide includes the basic documentation about the data provided by Cloud Interface for ABB Ability™ Condition Monitoring for powertrains. Note that, further in this manual Cloud Interface for ABB Ability™ Condition Monitoring for powertrains is referred as Cloud Interface.

Applicability

This guide applies to Cloud Interface for ABB Ability™ Condition Monitoring for powertrains, version 1.0 or later.

Compatibility

The Cloud Interface for ABB Ability™ Condition Monitoring for powertrains is a common interface for data collected by Smart Sensors and Condition Monitoring for Drives (CMD).

The Cloud Interface supports:

- all drives visible on Condition Monitoring for Drives (CMD), version 4.0 and
- all assets available on ABB Ability™ Smart Sensor API, version 7.4.

Target audience

This guide is intended for people who work on the Cloud Interface.

Related documents

Document	Code (English)
Cloud Interface for ABB Ability™ Condition Monitoring for powertrains reference guide	3AXD50000614936
Cloud Interface for ABB Ability™ Condition Monitoring for powertrains API guide	3AXD50000600670
Cloud Interface for ABB Ability™ Condition Monitoring for powertrains user guide	3AXD50000603152
Cybersecurity for ABB drives Technical guide	3AXD10000492137
ABB Ability™ Smart Sensor user guide	9AKK107045A8954

General information

See Cloud Interface documentation in this Swagger portal:

<https://api.conditionmonitoring.motion.abb.com/swagger/index.html>

Terms and abbreviations

Term	Description
Cloud Interface	Application programming Interface running in the cloud.
CMD	Condition Monitoring for drives. The CMD web portal and API are used to monitor drives.
Control board	Circuit board in which the control program runs
Control unit	Control board built in a housing (often rail-mountable)
Drive	Frequency converter for controlling AC motors
INU	Inverter unit
Inverter	Converts direct current and voltage to alternating current and voltage.
Inverter unit	Inverter module(s) under control of one control board, and related components. One inverter unit typically controls one motor.
ISU	IGBT supply unit
Parameter	In the drive control program, user-adjustable operation instruction to the drive, or signal measured or calculated by the drive. In some (for example fieldbus) contexts, a value that can be accessed as an object, eg, variable, constant, or signal.
Powertrain	Structure of Drives and Smart Sensor assets (motors, pumps, bearings, etc.)
Single drive	Drive for controlling one motor
Smart Sensor	Web portal and API to monitor assets, for eg. motors, pumps, bearings using specific sensors, etc.
Supply unit	Supply module(s) under control of one control board, and related components.
Warning	Signal caused by an existing alarm which does not lead to tripping of the device

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ABB Ability™ Condition Monitoring for drives data

Contents of this chapter

This chapter describes the basic drives data of ABB Ability™ Condition Monitoring for drives.

ABB Ability™ Condition Monitoring for drives

The below tables describe the different signal types for each available drive.

For more information of each drive type, contact ABB support.

■ Drive Vs firmware data

ACS580 drive

ID	Parameter	Name	Unit	Resolution	Firmware
01_01	motor_speed	Motor speed used	rpm	1 sec	asck2, asck4
01_07	motor_current	Motor current	A	1 min	
01_10	motor_torque	Motor torque	%	1 sec	
01_31	ambient_temp	Ambient temperature	° C	1 min	asck4
01_54	energy_consumption	Cumulative inverter energy	kWh	1 hour	asck2, asck4
05_10	ctrl_board_temp	Control board temperature	° C	1 min	asck2
99_10	motor_nominal_power	Motor nominal power	kW	1 day	asck2, asck4

ACH580 drive

ID	Parameter	Name	Unit	Resolution	Firmware
01_01	motor_speed	Motor speed used	rpm	1 sec	ahvk2, ahvk4
01_07	motor_current	Motor current	A	1 min	
01_10	motor_torque	Motor torque	%	1 sec	
01_31	ambient_temp	Ambient temperature	° C	1 min	ahvk4
01_54	energy_consumption	Cumulative inverter energy	kWh	1 hour	ahvk2, ahvk4
05_10	ctrl_board_temp	Control board temperature	° C	1 min	ahvk2
99_10	motor_nominal_power	Motor nominal power	kW	1 day	ahvk2, ahvk4

ACQ580 drive

ID	Parameter	Name	Unit	Resolution	Firmware
01_01	motor_speed	Motor speed used	rpm	1 sec	aqak2, aqak4
01_07	motor_current	Motor current	A	1 min	
01_10	motor_torque	Motor torque	%	1 sec	
01_31	ambient_temp	Ambient temperature	° C	1 min	aqak4
01_54	energy_consumption	Cumulative inverter energy	kWh	1 hour	aqak2, aqak4
05_10	ctrl_board_temp	Control board temperature	° C	1 min	aqak2
99_10	motor_nominal_power	Motor nominal power	kW	1 day	aqak2, aqak4

ACS800 drive

ID	Parameter	Name	Unit	Resolution	Firmware
01_01	motor_speed	Motor speed used	rpm	1 sec	ajxc
01_02	motor_torque	GENERATOR TORQUE	%	1 min	
01_06	motor_current	Motor current	A	1 min	
01_14	energy_consumption_kwh	TOTAL ENERGY	kWh	1 h	
01_18	ctrl_board_temp	CABIN TEMP	° C	1 min	
99_06	motor_nominal_power	Motor nominal power	kW	1 day	

■ Inverter unit Vs firmware data

ACS580 medium voltage inverter unit

ID	Parameter	Name	Unit	Resolution	Firmware
01_01	motor_speed	Motor speed used	rpm	1 sec	MHD
01_07	motor_current	Motor current	A	1 min	
01_10	motor_torque	Motor torque	%	1 sec	
01_20	energy_consumption_kwh	Mot - regen energy kWh	kWh	1 h	
01_31	ambient_temp	Ambient temperature	° C	1 min	
99_10	motor_nominal_power	Motor nominal power	kW	1 day	

ACS880 single drive or inverter unit

ID	Parameter	Name	Unit	Resolution	Firmware
01_01	motor_speed	Motor speed used	rpm	1 sec	ainf
01_07	motor_current	Motor current	A	1 min	
01_10	motor_torque	Motor torque	%	1 sec	
01_31	ambient_temp	Ambient temperature	° Ch	1 min	
01_37	energy_consumption_kwh	Mot - regen energy kWh	kWh	1 hour	
99_10	motor_nominal_power	Motor nominal power	kW	1 day	

■ **Drive Vs loading package data**

ACS800 drive

ID	Parameter	Name	Unit	Resolution	Loading package
01_04	motor_speed	Motor speed used	rpm	1 sec	anxr, amxr, aqtb, aqws, aqwp
01_06	motor_current	Motor current	A	1 min	
01_08	motor_torque	Filtered motor torque	%	1 sec	
01_14	energy_consumption_kwh	TOTAL ENERGY	kWh	1 h	
03_16	ctrl_board_temp	CTRL BOARD TEMP	° C	1 min	
99_06	motor_nominal_power	Motor nominal power	kW	1 day	

ACS800 drive

ID	Parameter	Name	Unit	Resolution	Loading package
01_02	motor_speed	Motor speed used	rpm	1 sec	asxr, as7r, aqcr, aqwi, adxr, aqpm, aexr
01_04	motor_current	CURRENT	A	1 min	
01_05	motor_torque	TORQUE	%	1 min	
01_15	energy_consumption_kwh	KILOWATT HOURS	kWh	5 min	
01_45	ctrl_board_temp	CTRL BOARD TEMP	° C	1 min	
99_09	motor_nominal_power	MOTOR NOM POWER	kW	1 day	

ACS800 drive

ID	Parameter	Name	Unit	Resolution	Loading package
01_05	supply_frequency	FREQUENCY	Hz	1 min	idxr, iwxxr, ixxr, ilxr
01_06	line_current	LINE CURRENT	A	1 sec	
01_07	reactive_power	REACTIVE POWER	kVAr	1 min	iwxxr, ixxr, ilxr
01_08	motor_power	POWER	kW	1 min	idxr, iwxxr, ixxr, ilxr
01_10	dc_bus_volt	DC VOLTAGE	V	1 sec	
01_14	energy_consumption	KWH SUPPLY	kWH	5 min	
108_08	ctrl_board_temp	Ctrl Board Temp	° C	1 min	idxr

ACS1000 drive

ID	Parameter	Name	Unit	Resolution	Loading packages
01_03	motor_speed	Filtered Motor Speed	rpm	1 sec	msoh, msoi
01_07	motor_current	Motor current	A	1 min	
01_08	motor_torque	Filtered Motor Torque	%	1 sec	
04_02	InvWtrCoolTemp	InvWtrCoolTemp	° C	1 min	
06_09	energy_consumption	Consumed Energy	MWh	1 hour	
99_09	motor_nominal_power	Motor Nominal Power	kW	1 day	

■ Inverter supply unit Vs loading package data

ACS880 inverter supply unit

ID	Parameter	Name	Unit	Resolution	Loading package
101_01	dc_bus_volt	DC VOLTAGE	V	1 sec	adi, aisl, alhl
101_02	line_current	Line current	A	1 sec	
101_08	supply_frequency	Frequency	Hz	1 min	
101_12	motor_power	Power	kW	1 min	
101_22	energy_consumption_kwh	kWh supply	kWH	1 hour	
101_31	ambient_temp	Ambient temperature	° C	1 min	

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ABB Ability™ Smart Sensor data

Contents of this chapter

This chapter describes the measurement data of ABB Ability™ Smart Sensors.

ABB Ability™ Smart Sensor

The below tables describe the different measurement types for each available Smart Sensor. For more information of each Smart Sensor, contact ABB support.

■ Motor data

ID	Parameter	Name	Unit
2	Speed	Speed	rpm
3	Slip	Slip	
4	Skin Temperature	Skin Temperature	° C
6	Operating Power	Operating Power	kW
7	Loading	Loading	%
8	Overall Vibration	Overall Vibration	mm/s RMS
9	Operating Time	Operating Time	h
10	Number of Starts	Number of Starts	
12	Motor Status	Motor Status	
14	Kurtosis (X)	Kurtosis (X)	
15	Motor Supply Frequency	Motor Supply Frequency	Hz
16	Kurtosis (Y)	Kurtosis (Y)	
18	Kurtosis (Z)	Kurtosis (Z)	
19	Eccentricity	Eccentricity	%
20	Start Time	Start Time	

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ID	Parameter	Name	Unit
22	Cooling Condition	Cooling Condition	
24	Check Sum	Check Sum	
25	Broken Rotor bar Index	Broken Rotor bar Index	%
26	Sequence Number	Sequence Number	
27	Bearing Condition	Bearing Condition	
30	Prev motor Status	Prev motor Status	
31	Vibration (Radial)	Vibration (Radial)	mm/s RMS
32	Vibration (Tangential)	Vibration (Tangential)	mm/s RMS
33	Vibration (Axial)	Vibration (Axial)	mm/s RMS
34	Ambient Temperature	Ambient Temperature	° C
35	Total Energy Consumption	Total Energy Consumption	kWh
64	Output Power	Output Power	kW
65	Regreasing Advice	Regreasing Advice	H
66	Simple Misalignment	Simple Misalignment	
67	Nr. Of Starts Between Measurements	Nr. Of Starts Between Measurements	
71	KPI Harmonics X1	KPI Harmonics X1	
72	KPI Harmonics X2	KPI Harmonics X2	
73	KPI Harmonics X3	KPI Harmonics X3	
74	KPI Harmonics X4	KPI Harmonics X4	
75	KPI Harmonics X5	KPI Harmonics X5	
76	KPI Harmonics Y1	KPI Harmonics Y1	
77	KPI Harmonics Y2	KPI Harmonics Y2	
78	KPI Harmonics Y3	KPI Harmonics Y3	
79	KPI Harmonics Y4	KPI Harmonics Y4	
80	KPI Harmonics Y5	KPI Harmonics Y5	
81	KPI Harmonics Z1	KPI Harmonics Z1	
82	KPI Harmonics Z2	KPI Harmonics Z2	
83	KPI Harmonics Z3	KPI Harmonics Z3	
84	KPI Harmonics Z4	KPI Harmonics Z4	
85	KPI Harmonics Z5	KPI Harmonics Z5	
86	Amplitude Fs	Amplitude Fs	
88	Misalignment	Misalignment	
91	Speed Reference Direction	Speed Reference Direction	
92	Signed Speed	Signed Speed	
93	RMS Speed Closeness	RMS Speed Closeness	
94	RMS Speed Quality	RMS Speed Quality	
183	Rotor Bar	Rotor Bar	
208	Operating Load	Operating Load	
209	Motor Running Time	Motor Running Time	
210	Intermediate KPI	Intermediate KPI	
211	Phase A Temperature	Phase A Temperature	° C
212	Phase B Temperature	Phase B Temperature	° C

ID	Parameter	Name	Unit
213	Phase C Temperature	Phase C Temperature	° C
214	DE Bearing Temperature	DE Bearing Temperature	° C
215	NDE Bearing Temperature	NDE Bearing Temperature	° C
216	Unbalance Index	Unbalance Index	
217	Eccentricity Index	Eccentricity Index	
218	Vibration (DE Vertical)	Vibration (DE Vertical)	
219	Vibration (NDE Vertical)	Vibration (NDE Vertical)	
220	Vibration (Body Horizontal)	Vibration (Body Horizontal)	
221	Vibration (DE Horizontal)	Vibration (DE Horizontal)	
222	Motor On/Off	Motor On/Off	

■ Pump data

ID	Parameter	Name	Unit
36	Operating Time	Operating Time	Hour
37	Number Of Starts	Number Of Starts	
38	Vibration (Axial)	Vibration (Axial)	mm/s RMS
39	Vibration (Tangential)	Vibration (Tangential)	mm/s RMS
40	Vibration (Radial)	Vibration (Radial)	mm/s RMS
41	Pump Speed	Pump Speed	rpm
42	Bearing Indicator (Axial)	Bearing Indicator (Axial)	
43	Bearing Indicator (Tangential)	Bearing Indicator (Tangential)	
44	Bearing Indicator (Radial)	Bearing Indicator (Radial)	
45	Blade Problem	Blade Problem	
46	Flow Turbulence	Flow Turbulence	
47	Looseness	Looseness	
48	Misalignment	Misalignment	
49	Cavitation	Cavitation	
50	Unbalance	Unbalance	
51	Clogging	Clogging	
52	Pump Status	Pump Status	
53	Pump Running Time	Pump Running Time	min
68	Nr. Of Starts Between Measurements	Nr. Of Starts Between Measurements	
87	Overall Vibration	Overall Vibration	mm/s RMS
89	Skin Temperature	Skin Temperature	° C
90	Bearing Condition	Bearing Condition	
202	Motor Speed	Motor Speed	

■ Bearing data

ID	Parameter	Name	Unit
54	Index	Index	
55	Acceleration RMS	Acceleration RMS	g RMS
56	Kurtosis	Kurtosis	
57	Skewness	Skewness	
58	Peak	Peak	
59	Form Factor	Form Factor	
60	Temperature Top	Temperature Top	° C
61	Bearing Skin Temperature	Bearing Skin Temperature	° C
62	Temperature MCU	Temperature MCU	° C
63	Flags	Flags	
107	Velocity RMS	Velocity RMS	mm/s RMS
108	Peak Acceleration	Peak Acceleration	g RMS
109	Peak Velocity	Peak Velocity	mm/s RMS
115	Crest Factor	Crest Factor	
198	Index Inner Race	Index Inner Race	
199	Index Outer Race	Index Outer Race	
200	Index Roller Race	Index Roller Race	
201	Index Cage Race	Index Cage Race	
203	Bearing Running Time	Bearing Running Time	

■ Ambient temperature data

ID	Parameter	Name	Unit
69	Ambient Temperature	Ambient Temperature	° C
70	Ambient Humidity	Ambient Humidity	%

■ ECMDrive data

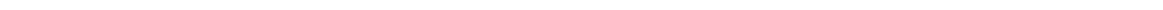
ID	Parameter	Name	Unit
95	Drive Module Temperature	Drive Module Temperature	° C
96	Drive Control Board Temperature	Drive Control Board Temperature	° C
97	DC Bus Ripple Voltage	DC Bus Ripple Voltage	V
98	DI Status Word	DI Status Word	
99	DC Bus Voltage	DC Bus Voltage	V
100	Estimated Speed	Estimated Speed	
101	Output Voltage	Output Voltage	V
102	Output Current	Output Current	
103	Motor Torque	Motor Torque	
104	Motor Power	Motor Power	
105	ECM Drive Status	ECM Drive Status	
106	Drive Status Error Code	Drive Status Error Code	

■ GenericMachine data

ID	Parameter	Name	Unit
110	Skin Temperature	Skin Temperature	° C
111	Overall Vibration	Overall Vibration	
112	Vibration (Axial)	Vibration (Axial)	mm/s RMS
113	Vibration (Tangential)	Vibration (Tangential)	mm/s RMS
114	Vibration (Radial)	Vibration (Radial)	mm/s RMS

■ Gearing data

ID	Parameter	Name	Unit
184	Index	Index	
185	Acceleration RMS	Acceleration RMS	
186	Kurtosis	Kurtosis	
187	Skewness	Skewness	
188	Peak	Peak	
189	Form Factor	Form Factor	
190	Temperature Top	Temperature Top	° C
191	Bearing Skin Temperature	Bearing Skin Temperature	° C
192	Temperature MCU	Temperature MCU	° C
193	Flags	Flags	
194	Velocity RMS	Velocity RMS	mm/s RMS
195	Peak Acceleration	Peak Acceleration	
196	Peak Velocity	Peak Velocity	
197	Crest Factor	Crest Factor	
204	Index Inner Race	Index Inner Race	
205	Index Outer Race	Index Outer Race	
206	Index Roller Race	Index Roller Race	
207	Index Cage Race	Index Cage Race	





Drives and sensors information

Contents of this chapter

This chapter describes the different drives and sensors information monitored in the Cloud Interface.

Condition indexes

Index	Description
Reliability	Indicates consistent and reliable operation of the asset without degradation or failure of the required function. The accuracy of the KPI measurement and calculation is defined, for example, KPIs for asset maintenance or number of asset failures in the past operating period.
Environment	Indicates the impact of external and internal environmental parameters in the asset, for example, internal and / or external temperature and humidity at maximum or threshold values.
Availability	Defines committed and usable operation of the asset for required function.
Stress	Indicates load performance of the asset, i.e. current load Vs maximum load or current motor power Vs maximum power.

Events

Events	Description
Event Id	Unique ID of an event.
Event types	<ul style="list-style-type: none"> • Warning • Notification • Alert • Fault • Alarm

20 Drives and sensors information

Events	Description
Time stamp	Time at when the event occurred.
Description	Additional information of the event.
Event status	Current event status. <ul style="list-style-type: none">• Opened: Event is not yet handled• Closed: Event was handled

Installed base

Code	Description
Productcode	International key code for a unique product identification.
InstallationID	A multi-digit installation ID.
Serialnumber	International unique identifier for general identification.

Disclaimers

■ **Generic disclaimer**

The manufacturer shall have no obligation hereunder with respect to any product which (i) has been improperly repaired or altered; (ii) has been subjected to misuse, negligence or accident; (iii) has been used in a manner contrary to the Manufacturer's instructions; or (iv) has failed as a result of ordinary wear and tear. All material in this manual is subject to change without a further notice. The manual is intended as non-contractual document.

■ **Cybersecurity disclaimer**

This product is designed to be connected to and to communicate information and data via a network interface. It is Customer's sole responsibility to provide and continuously ensure a secure connection between the product and Customer network or any other network (as the case may be). Customer shall establish and maintain any appropriate measures (such as but not limited to the installation of firewalls, application of authentication measures, encryption of data, installation of anti-virus programs, etc) to protect the product, the network, its system and the interface against any kind of security breaches, unauthorized access, interference, intrusion, leakage and/or theft of data or information. ABB and its affiliates are not liable for damages and/or losses related to such security breaches, any unauthorized access, interference, intrusion, leakage and/or theft of data or information.

Further information

Product and service inquiries

Address any inquiries about the product to your local ABB representative, quoting the type designation and serial number of the unit in question. A listing of ABB sales, support and service contacts can be found by navigating to www.abb.com/searchchannels.

Product training

For information on ABB product training, navigate to new.abb.com/service/training.

Providing feedback on ABB manuals

Your comments on our manuals are welcome. Navigate to new.abb.com/drives/manuals-feedback-form.

Document library on the Internet

You can find manuals and other product documents in PDF format on the Internet at www.abb.com/drives/documents.



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