

F. No. 318/87/2024-GCRT -Part (1)
Government of India
Ministry of New and Renewable Energy
PMSG: MBY Division

Atal Akshay Urja Bhawan
Lodhi Road, New Delhi 110003,
Dated: 21st July 2025

Office Memorandum

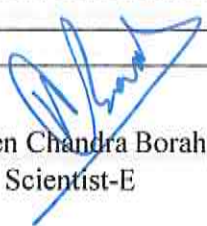
Subject: Seeking comments/ suggestions on draft Guideline on RMS for inverter communication devices/dongles/data-logger with Centralised Platform under PM Surya Ghar: Muft Bijli Yojana - reg.

MNRE vide OM (F. No. 318/87/2024-GCRT-Part (1)) dated 21st July 2025 has issued the compliance requirements for inverter and communication devices used under PM Surya Ghar: Muft Bijli Yojana. In this regard, a draft guideline on **RMS Communication with Centralised Platform** is prepared and is attached as **Annexure**. The comments, if any, may be sent to pmu-rtis@gov.in by 31st July 2025.

2. It is requested that comments/suggestions may please be sent in the following format *(in a word document file only)*:

Format for comments

Sr. No.	Page No. / Para No/Table No. with the description of the item	Comments	Remarks/ Justification


(Hiren Chandra Borah)
Scientist-E

To

- All Stakeholders

Annexure :
**Draft guidelines on RMS for inverter
communication devices/dongles/ data-logger
with Centralised Platform under
PM Surya Ghar: Muft Bijli Yojana**

This guideline outlines the communication and security architecture required for seamless integration of Remote Monitoring Systems (RMS), deployed in grid-connected solar power plants, with the Centralised Platform. It serves as a comprehensive reference for developers and system integrators to ensure standardized, secure, and interoperable data exchange across the solar energy ecosystem.

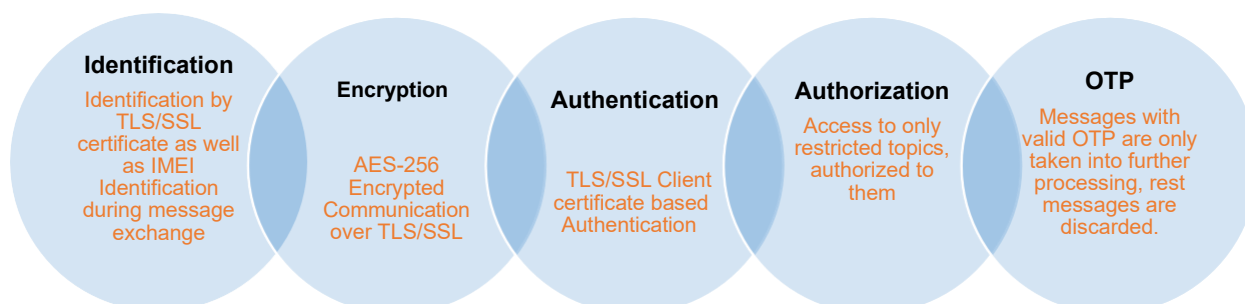
21.07.2025

RMS Communication & Security Architecture

1. Security Architecture
2. RMS Registration
3. MQTT Topic Structure
4. Communication Modes
5. Communication Protocol
6. Keyword Abbreviation
7. MQTT Message Structure
8. Annexure: JSON Formats with parameter keywords, sample values and description

1. Security Architecture

This section highlights the communication security architecture between RMS and CENTRALISED IoT Platform. With this security and architecture, third parties are unable to intercept or “sniff” the encrypted data. This stops ISPs, employers, local network administrators and cybercriminals from being able to perform “packet sniffing” to access what the traffic contains. It also protects against man in the middle (MitM) attacks. This implements Private TLS/SSL VPN to ensure the highest level of security.



In addition to this, use of OTP in every message exchange shall help restrict spammers and Bots. Such an OTP based mechanism will provide transaction level security, which is required for remote operations.

2. RMS Registration

This section details how individual RMS shall be registered and communicate securely with the CENTRALISED IoT Platform.

- Every supplier/vendor must Register all unique IMEI (International Mobile Equipment Identity) of RMS with CENTRALISED IoT Platform.
- CENTRALISED IoT Platform will generate individual client certificates for RMS against unique IMEI registered and shared with supplier/vendor through secured web API interface.
- Every supplier/vendor shall be able to access the web API with unique credentials shared with them.
- Web API shall return individual client certificates, username, password, ClientID, Device Management Server URL and “info” topic.
- After installation of client certificate relevant to IMEI of RMS, RMS will connect to Device Management Server and get authenticated using client certificate or username + password and further shall be able to receive additional configuration details such as FTP credential, Message Topic structure etc. after subscribing to default topic.
- After client certificate expiry, RMS will connect to FTP using available credentials and download the renewed certificate

3. MQTT Topic Structure

This section defines the different topic structure for communication between RMS and CENTRALISED IoT Platform through Device Management Server.

RMS will publish and subscribe to their respective topics only; authorization of topic shall be done against unique credentials.

Application Version	Solution	IMEI	Message Type	Publish/Subscribe
IIOT-1	Ongridrooftop	{IMEI}	Info	sub
	Offgridrooftop		OTP	sub
	SolarMW		Heartbeat	pub
			Data	pub
			Ondemand	sub
			Config	sub

Sample Topic structure for on grid Rooftop shall be:

IIOT- 1/ Ongridrooftop/{IMEI}/info/sub

Multiple sub-topics will be formed for communication between RMS and CENTRALISED PLATFORM IoT Platform

- **Info:** Default Topic To exchange RMS configuration details
- **OTP:** To exchange OTP at every interval of 15/30/60 minutes
- **Heartbeat:** To update RMS health indicators at frequent, configurable intervals.
- **Data:** To exchange data related to RMS Monitoring parameters in “push mode”
 - Push data Periodically
 - Push data on Event/Notification
 - History Missing Data Push Mode: History data will be identified against “index”
- **Ondemand:** To exchange data between RMS and Server in “Command on Demand” Mode
 - Each “On Demand” message will have two transactions: Commands, Response.
 - On demand command and response will be tracked against a common “MSGID”.
 - On demand message can be used to read and write with two command types
 - Command: “Read” - In Json received from server replace each key with value from RMS and send the updated Json back to server.
 - Command: “Write” - After executing the command based on key-value pairs received in Json, send the updated Json back to server for successful execution.
 - Note: handshaking parameters such as msgid, etc. has to send back to server as is, without modification
- **Config:** To update configurable parameters of Device, which is similar to Ondemand but will be used only for configurable parameters of Device, this implements “Configuration over the air”
 - Command: “Read” - In json received from server replace each key with value from RMS and send the updated json back to server.
 - Command: “Write” - After executing the command based on key-value pairs received in json, send the updated json back to server for successful execution.
 - Note: Handshaking parameters such as msgid, etc. have to be sent back to server as is, without modification.

4. Communication Modes

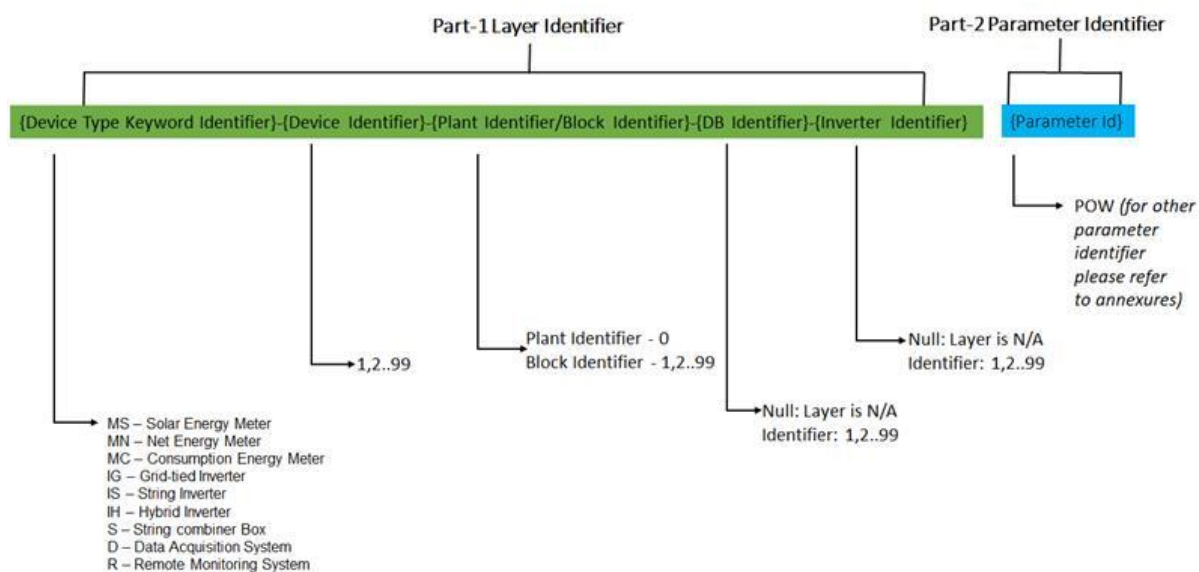
- **Push on Periodic Interval:** In this mode deployed RMS shall transmit data of Multiple devices and sensors on different configurable time intervals such as Inverter at every 5 minutes, Energy Meter data at every 15 minutes, String Combiner Box data at every 10 minutes
- **Push on Event:** RMS shall detect various configurable alarm or event conditions such as Inverter On/Off Status, Fault or Trip status etc. and it shall transmit data immediately to the server
- **On Demand Read:** In this mode, User will send command to RMS to get data as and when required and RMS will send the required data to server immediately
- **On Demand Write:** In case of Remote Operations, Consumer shall send On Demand Write Command to the RMS and RMS will send back the acknowledgement with change in parameters after operation is completed
- **Configuration read/write:** Using this mode, user will be able to read and change configurable parameters remotely such as updating periodic interval, alarm limits, server parameters etc.

5. Communication Protocols

- **Field Device Communication:** RMS to Field Devices communication such as Inverter, MFT/MFM, Data Acquisition System shall be established using MODBUS RTU protocol supported by all leading manufacturers globally
- **Energy Meter Communication:** RMS to Energy Meter communication such as Bidirectional (Revenue) Meter, Solar Generation (Audit) Meter shall be established using DLMS/Modbus protocol supported by all leading meter manufacturers in India
- **RMS to Server Communication – IEC20922 (MQTT):** RMS to Server Communication shall be established using IEC20922 (MQTT) protocol which is well accepted IoT protocol across the globe and supported by all leading IT as well as OT companies for Smart Grid, Smart RE and Smart City Applications.

6. Keyword Abbreviation

Solar Systems comprises of many communicable equipment such as Inverter, Energy Meter, String combiner box, weather station etc. This equipment's are installed and measured at plant level as well Block level, accordingly all the parameters to be measured must be uniquely identified thus below keyword designer to be referred for JSON annexure preparation.



Part-1 Layer Identifier: {Device Type Keyword Identifier}-{DeviceId}-{Plant/BlockId}-{DB Id}-{Inverter Id}-

Part-2 Parameter Identifier: {Parameter Id} - As per Annexure.

Sample Parameter Description	Sample Unique JSON Keyword
Total Active Power of 5 th String combiner box of 2 nd inverter of 1 st DB of 2 nd Block (With DB)	S-5-2-1-2-POW
Total Active Power of 5 th String combiner box of 2 nd inverter of 2 nd Block (Without DB)	S-5-2- -2-POW <i>As DB layer is not mentioned, DB id is not included so Null value between two hyphens to be mentioned.</i>
Total Active Power of 2 nd Grid tied Inverter of 3 rd DB of 2 nd Block (With DB)	IG-2-2-3- -POW <i>As this parameter belong to inverter so no need of duplicating inverter identifier. So Null value between two hyphens to be mentioned.</i>
Total Active Power of 3 rd Grid tied Inverter of 2 nd Block (Without DB)	IG-3-2- - -POW <i>As DB layer is not mentioned, DB id is not included so Null value between two hyphens to be mentioned. As this parameter belong to inverter so no need of duplicating inverter identifier. So, Null value between three hyphens in this required parameter</i>
Total Active Power of 95 th Hybrid Inverter of the plant	IH-95-0- - -POW
Total Active Power of 7 th Net Energy meter of entire plant	MN-7-0- - -POW
Total Active Power of 3 rd Solar Energy meter of 1 st Block	MS-3-1- - -POW
Total Active Power of 9 th Consumption Energy Meter of 1 st block of 2 nd DB	MC-9-1-2- -POW

**for parameter id refer to below annexures of different device types

7. MQTT Message Structure

This section details message structure exchanged between RMS and CENTRALISED PLATFORM IoT Platform through Device Management Server. This message structure comprises of System reserved keywords (common for all equipment JSON formats - header) and equipment wise parameters.

Sample Keyword	Sample Description	Sample Value													
IMEI	Unique Identification of RMS – required to ensure registered source of data	863287049443888	System Reserved Header keywords, which are to be used as is in JSON exchange between RMS and CENTRALISED PLATFORM IoT Platform, without prefix of Part-1 Layer Identifier												
VD	Virtual device/group – required for grouping of parameters based on update interval / subsystems such as String inverter, String Combiner Box, Energy Meter, , Data Acquisition System etc. <table><tr><td>Example of Virtual Device Number (say)</td><td>Device Type</td></tr><tr><td>0</td><td>RMS Health</td></tr><tr><td>1</td><td>-----</td></tr><tr><td>2-4</td><td>Energy Meters</td></tr><tr><td>5-24</td><td>Inverter, String Inverter / String Combiner Box</td></tr><tr><td>25-27</td><td>Data Acquisition System</td></tr></table>	Example of Virtual Device Number (say)		Device Type	0	RMS Health	1	-----	2-4	Energy Meters	5-24	Inverter, String Inverter / String Combiner Box	25-27	Data Acquisition System	2
Example of Virtual Device Number (say)	Device Type														
0	RMS Health														
1	-----														
2-4	Energy Meters														
5-24	Inverter, String Inverter / String Combiner Box														
25-27	Data Acquisition System														
MSGID	Message Transaction Id - required for “Ondemand”/ “Config” message type, request/response/acknowledgement/feedback	123456789													
COMMAND	Read/Write - Applicable only in case of “Ondemand”/ “Config” message Type	Read													
TIMESTAMP	RTC timestamp of RMS against all parameters of VD / group (YYYY-MM-DD HH:MM: SS)	“2019-08-20 20:15:08”													
STINTERVAL	Periodic interval at which RMS shall store and transmit data to the server. (in minutes)	15													
DATE	local storage date – required as a reference to fetch data from local storage (YYMMDD)	220616													
INDEX	Local storage Index – required as a reference to fetch data from local storage	5													
MAXINDEX	Local storage maximum index of local storage date – required to calculate missing index	96													
LOAD	Local storage retrieval command & status	0													
POTP	Previous One Time Password	123456													
COTP	Current One Time Password, National/State Server will update OTP at interval of 30/60 minutes	123456													
Parameter-1 Parameter-2 Parameter-3 Parameter-1 Parameter-n	Equipment-wise Keywords for multiple Parameters, These Keywords are to be prepared using: Part-1 Layer Identifier: {Device Type Keyword Identifier}- {DeviceId}- {Plant/BlockId}- {DB Id}- {Inverter Id}- Part-2 Parameter Identifier: {Parameter Id} - As per Annexure.														

Annexure-1: Single Phase-String Inverter (IS)				
Message Name : Periodic Push Inverter Data Message Format : JSON Message Type : Data Message Command Flow : Not Applicable for Data periodic Push Message response Flow : RMS -> CENTRALISED PLATFORM IoT Platform Message Medium : Cellular (4G/5G fallback to 2G) Keyword structure : "{Part-1: Layer Identifier}- {Part-2: Parameter Identifier}" Combined Sample Keyword : IS-1-2-3- -POW				
Sample Keyword Part-2: Parameter Identifier	Sample Description	Sample Unit	Sample Value	Sample Requirement in JSON
VD	Virtual Device Index/Group	-	5	Must Have
TIMESTAMP	RTC timestamp of RMS against all parameters of VD/group YYYY-MM-DD HH:MM: SS	-	2025-04-22 17:58:25	Must Have
MAXINDEX	maximum index of local storage date	-	96	Must Have
INDEX	reference of local storage	-	7	Must Have
LOAD	Local storage retrieval command & status	-	0	Must Have
STINTERVAL	Periodic interval at which RMS shall store and transmit data to the server. (in minutes)	-	15	Must Have
MSGID	Message Transaction Id - required for "Ondemand"/" Config" message type, request/response/acknowledgement/ feedback	-	10	Must Have
DATE	local storage date YYMMDD	-	250422	Must Have
IMEI	IMEI No. of First Sim to be considered always for unique identity of RMS	-	123456123456123	Must Have
ASN_31	Inverter Serial Number		31123450	Must Have
	RMS	0		
	DAQ	1-9		
	-----	11-19		
	Meter	21-29		
	Inverter, String Inverter /String Combiner Box	31-50		
POTP	Previous One Time Password	-	341234	Must Have
COTP	Current One Time Password	-	123456	Must Have
IST	Inverter Status OFF: 0, ON: 1, FAULT :2, Other: 3	-	1	Must Have
DCV1	DC-1 Voltage (Similar for Up to N DC Channel Voltage)	Volts	500.25	Must Have
DCI1	DC-1 Current (Similar for Up to N DC Channel Current)	Amp	200.12	Must Have
DCKW1	DC-1 Power	kW	856.24	Must Have

	(Similar for Up to N DC Channel Power)			
VN	Phase to Neutral voltage	Volts	0.96	Must Have
I	Phase current	Amp	50.05	Must Have
POW	Active Power	kW	50.05	Must Have
TKWH	Today Generated Energy	kWh	99999999.99	Must Have
TON	Today on Time of Inverter To convert Today running minutes into hours, simply divide by 60 $250/60 = 4.16$ Hrs.	Hrs.	4.16	Must Have
LKWH	Lifetime Generated Energy	kWh	99999999.99	Must Have
LON	Lifetime running hours To convert lifetime running minutes into hours, simply divide by 60 $250/60 = 4.16$ Hrs.	Hrs.	12.12	Must Have
TEMP	Inverter Temperature	Deg C	15.31	Must Have
FREQ	Frequency	Hz	49.98	Must Have
PF	Power Factor	-	0.85	Must Have
APOW	Apparent power	kVA	123.74	Must Have
RPOW	Reactive power	kVAr	456.23	Must Have
FT1	Fault-1 Normal: 0 VAC High: 1 VAC Low: 2 Grid Voltage Fail: 3	-	1	Must Have
FT2	Fault-2 Normal :0 Frequency High: 1 Frequency Low: 2	-	2	Must Have
FT3	Fault-3 Normal :0 AC Output overload :1 PV Short Circuit :2 AC Short circuit fault: 3 Leakage Current High: 4	-	0	Must Have
FT4	Fault-4 Normal :0 High Temperature: 1	-	0	Must Have
FT5	Fault-5 Normal: 0 Other Fault: 1	-	1	Must Have

Annexure-2 Three Phase - String Inverter (IS) / Three Phase-Grid Tied Inverter (IG)																
Message Name : Periodic Push Inverter Data																
Message Format : JSON																
Message Type : Data																
Message Command Flow : Not Applicable for Data periodic Push																
Message response Flow : RMS -> CENTRALISED PLATFORM IoT Platform																
Message Medium : Cellular (4G/5G fallback to 2G)																
Keyword structure :“{Part-1: Layer Identifier}- {Part-2: Parameter Identifier}”																
Combined Sample Keyword : IS-1-2-3- -POW (for String Inverter) IG-1-2-3- -POW (for Central Inverter)																
Sample Keyword Part-2: Parameter Identifier	Sample Description	Sample Unit	Sample Value	Sample Requirement in JSON												
VD	Virtual Device Index/Group	-	5	Must Have												
TIMESTAMP	RTC timestamp of RMS against all parameters of VD/group YYYY-MM-DD HH:MM: SS	-	2025-04-22 17:58:25	Must Have												
MAXINDEX	maximum index of local storage date	-	96	Must Have												
INDEX	reference of local storage	-	7	Must Have												
LOAD	Local storage retrieval command & status	-	0	Must Have												
STINTERVAL	Periodic interval at which RMS shall store and transmit data to the server. (in minutes)	-	15	Must Have												
MSGID	Message Transaction Id - required for “Ondemand”/” Config” message type, request/response/acknowledgement/ feedback	-	10	Must Have												
DATE	local storage date YYMMDD	-	250422	Must Have												
IMEI	IMEI No. of First Sim to be considered always for unique identity of RMS	-	123456123456123	Must Have												
ASN_32	<table><tr><th colspan="2">Inverter Serial Number</th></tr><tr><td>RMS</td><td>0</td></tr><tr><td>DAQ</td><td>1-9</td></tr><tr><td>-----</td><td>11-19</td></tr><tr><td>Meter</td><td>21-29</td></tr><tr><td>Inverter, String Inverter /String Combiner Box</td><td>31-50</td></tr></table>	Inverter Serial Number		RMS	0	DAQ	1-9	-----	11-19	Meter	21-29	Inverter, String Inverter /String Combiner Box	31-50	-	34123450	Must Have
Inverter Serial Number																
RMS	0															
DAQ	1-9															
-----	11-19															
Meter	21-29															
Inverter, String Inverter /String Combiner Box	31-50															
POTP	Previous One Time Password	-	123412	Must Have												
COTP	Current One Time Password	-	412345	Must Have												
IST	Inverter Status OFF: 0, ON: 1, FAULT :2, Other: 3	-	1	Must Have												
DCV1	DC-1 Voltage (Similar for Up to N DC Channel Voltage)	Volts	500.25	Must Have												
DCI1	DC-1 Current (Similar for Up to N DC Channel Current)	Amp	200.12	Must Have												

DCKW1	DC-1 Power (Similar for Up to N DC Channel Power)	kW	200.12	Must Have
RPHV	R phase voltage	Volts	230.45	Must Have
RPHI	R phase current	Amp	10.50	Must Have
POWR	R phase Active Power	kW	2.49	Must Have
YPHV	Y phase voltage	Volts	231.45	Must Have
YPHI	Y phase current	Amp	11.50	Must Have
POWY	Y phase Active Power	kW	3.49	Must Have
BPHV	B phase voltage	Volts	232.45	Must Have
BPHI	B phase current	Amp	12.50	Must Have
POWB	B phase Active Power	kW	3.80	Must Have
POW	Total Active Power	kW	9.45	Must Have
TKWH	Today Generated Energy	kWh	99999999.99	Must Have
TON	Today ON Time of Inverter To convert Today running minutes into hours, simply divide by 60 $250/60 = 4.16$ Hrs.	Hrs.	11.15	Must Have
LKWH	Lifetime Generated Energy	kWh	99999999.99	Must Have
LON	Lifetime running hours To convert Today running minutes into hours, simply divide by 60 $250/60 = 4.16$ Hrs.	Hrs.	12.12	Must Have
TEMP	Inverter Temperature	Deg C	15.31	Must Have
FREQ	Frequency	Hz	49.89	Must Have
PF	Power Factor	-	0.85	Must Have
APOW	Apparent power	kVA	123.74	Must Have
RPOW	Reactive power	kVAr	456.23	Must Have
FT1	Fault-1 Normal: 0 VAC High: 1 VAC Low: 2 Grid Voltage Fail: 3 Voltage un-balance: 4	-	1	Must Have
FT2	Fault-2 Normal :0 Frequency High: 1 Frequency Low: 2	-	2	Must Have
FT3	Fault-3 Normal :0 AC Output overload :1 PV Short Circuit :2 AC Short circuit fault: 3 Leakage Current High: 4	-	0	Must Have
FT4	Fault-4 Normal :0 High Temperature: 1	-	0	Must Have
FT5	Fault-5 Normal: 0 Other Fault: 1	-	1	Must Have

Annexure-3 Single Phase-Hybrid Inverter (IH)

Message Name : Periodic Push Hybrid Inverter Data
 Message Format : JSON
 Message Type : Data
 Message Command Flow : Not Applicable for Data periodic Push
 Message response Flow : RMS -> CENTRALISED PLATFORM IoT Platform
 Message Medium : Cellular (4G/5G fallback to 2G)
 Keyword structure : "{Part-1: Layer Identifier}- {Part-2: Parameter Identifier}"
 Combined Sample Keyword : **IH-10-2-3- -POW**

Sample Keyword Part-2: Parameter Identifier	Sample Description	Sample Unit	Sample Value	Sample Requirement in JSON	
VD	Virtual Device Index/Group	-	5	Must Have	
TIMESTAMP	RTC timestamp of RMS against all parameters of VD/group YYYY-MM-DD HH:MM: SS	-	2025-04-22 17:58:25	Must Have	
MAXINDEX	maximum index of local storage date	-	96	Must Have	
INDEX	reference of local storage	-	7	Must Have	
LOAD	Local storage retrieval command & status	-	0	Must Have	
STINTERVAL	Periodic interval at which RMS shall store and transmit data to server. (in minutes)	-	15	Must Have	
MSGID	Message Transaction Id - required for “Ondemand”/” Config” message type, request/response/acknowledgement/feedback	-	10	Must Have	
DATE	local storage date YYMMDD	-	200518	Must Have	
IMEI	IMEI No. of First Sim to be considered always for unique identity of RMS	-	123456123456 123	Must Have	
ASN_33	Inverter Serial Number		-	33123450	Must Have
	RMS	0			
	DAQ	1-9			
	-----	11-19			
	Meter	21-29			
	Inverter, String Inverter /String Combiner Box	31-50			
POTP	Previous One Time Password	-	341234	Must Have	
COTP	Current One Time Password	-	341234	Must Have	
IST	Inverter Status OFF: 0, ON: 1, FAULT :2, Other: 3	-	1	Must Have	
DCV1	DC-1 Voltage (Similar for Up to N DC Channel Voltage)	Volts	500.25	Must Have	
DCI1	DC-1 Current (Similar for Up to N DC Channel Current)	Amp	200.12	Must Have	

DCKW1	DC-1 Power (Similar for Up to N DC Channel Power)	kW	200.12	Must Have
VN	Phase to Neutral Voltage	Volts	230.45	Must Have
I	Phase current	Amp	10.50	Must Have
POW	Active Power	kW	2.49	Must Have
TKWH	Today Generated Energy	kWh	99999999.99	Must Have
TON	Today ON Time of Inverter To convert lifetime running minutes into hours, simply divide by 60 $250/60 = 4.16$ Hrs.	Hrs.	11.15	Must Have
LKWH	Lifetime Generated Energy	kWh	99999999.99	Must Have
LON	Lifetime running hours To convert lifetime running minutes into hours, simply divide by 60 $250/60 = 4.16$ Hrs.	Hrs.	12.12	Must Have
TEMP	Inverter Temperature	Deg C	15.31	Must Have
FREQ	Frequency	Hz	49.89	Must Have
PF	Power Factor	-	0.85	Must Have
APOW	Apparent power	kVA	123.74	Must Have
RPOW	Reactive power	kVAr	456.23	Must Have
BCHTKWH	Today Battery Charge Energy from PV	kWh	99999999.99	Must have
BCHLKWH	Lifetime Battery Charge Energy from PPV	kWh	99999999.99	Must have
IMODE	Inverter Mode 1- Power Feed in the Grid 2- Importing Power from Grid 3- No Power Imported from Grid 4- Islanding Mode	-	1	Must have
BST	Battery Status Healthy : 1 Faulty : 2	-	1	Must Have
BCST	Charging Status Charging: 1 Discharging :2 Idle:3	-	2	Must Have
BDCV	Battery Voltage	DC V	58.24	Must Have
BDCI	Total Battery Current	DC I	15.12	Must Have
BCH%	%Battery Charge	%	90.75	Must Have
BHL%	% Battery Health	%	95.50	Must Have
BTEMP	Battery Temperature	Deg C	55.12	Must Have
BCV	Battery Charging Voltage	DC V	20.12	Must Have
BCC	Battery Charging current	Amp	15.12	Must Have
BWMOD	Working Mode 0: Self-consumption, 1: Peak shaving, 2: Battery Priority, 3: Load Shifting, 4: ToU Optimization, 5: Grid Support Mode, 6: PV Priority Mode, 7: Demand Response Mode	-	0	Good to Have
BDRT	Battery Discharging Rate	%	50.00	Good to Have

BDPWD	Battery Discharging Power Dispatching	%	15.50	Optional
BCHCTO%	Battery Charging Cut-off Capacity Range: 90 - 100 %	%	95.50	Must Have
BDCHCTO%	Battery Discharging Cut-Off Capacity 12 -20%	%	15.50	Must Have
FT1	Fault-1 Normal: 0 VAC High: 1 VAC Low: 2 Grid Voltage Fail: 3 Voltage un-balance: 4	-	1	Must Have
FT2	Fault-2 Normal :0 Frequency High: 1 Frequency Low: 2	-	2	Must Have
FT3	Fault-3 Normal :0 AC Output overload :1 PV Short Circuit :2 AC Short circuit fault: 3 Leakage Current High: 4	-	0	Must Have
FT4	Fault-4 Normal :0 High Temperature: 1	-	0	Must Have
FT5	Fault-5 Normal: 0 Other Fault: 1	-	1	Must Have

Annexure-4 Three Phase-Hybrid Inverter (IH)					
Message Name : Periodic Push Hybrid Inverter Data					
Message Format : JSON					
Message Type : Data					
Message Command Flow : Not Applicable for Data periodic Push					
Message response Flow : RMS -> CENTRALISED PLATFORM IoT Platform					
Message Medium : Cellular (4G/5G fallback to 2G)					
Keyword structure : "{Part-1: Layer Identifier}- {Part-2: Parameter Identifier}"					
Combined Sample Keyword : IH-10-2-3- -POW					
Sample Keyword Part-2: Parameter Identifier	Sample Description	Sample Unit	Sample Value	Sample Requirement in JSON	
VD	Virtual Device Index/Group	-	5	Must Have	
TIMESTAMP	RTC timestamp of RMS against all parameters of VD/group YYYY-MM-DD HH:MM: SS	-	2025-04-22 17:58:25	Must Have	
MAXINDEX	maximum index of local storage date	-	96	Must Have	
INDEX	reference of local storage	-	7	Must Have	
LOAD	Local storage retrieval command & status	-	0	Must Have	
STINTERVAL	Periodic interval at which RMS shall store and transmit data to server. (in minutes)	-	15	Must Have	
MSGID	Message Transaction Id - required for "Ondemand"/" Config" message type, request/response/acknowledgement/feedback	-	10	Must Have	
DATE	local storage date YYMMDD	-	200518	Must Have	
IMEI	IMEI No. of First Sim to be considered always for unique identity of RMS	-	123456123456123	Must Have	
ASN_34	Inverter Serial Number		-	34123450	Must Have
	RMS	0			
	DAQ	1-9			
	-----	11-19			
	Meter	21-29			
	Inverter, String Inverter /String Combiner Box	31-50			
POTP	Previous One Time Password	-	341234	Must Have	
COTP	Current One Time Password	-	341234	Must Have	
IST	Inverter Status OFF: 0, ON: 1, FAULT :2, Other: 3	-	1	Must Have	
DCV1	DC-1 Voltage (Similar for Up to N DC Channel Voltage)	Volts	500.25	Must Have	
DCI1	DC-1 Current	Amp	200.12	Must Have	

	(Similar for Up to N DC Channel Current)			
DCKW1	DC-1 Power (Similar for Up to N DC Channel Power)	kW	200.12	Must Have
RPHV	R phase voltage	Volts	230.45	Must Have
RPHI	R phase current	Amp	10.50	Must Have
POWR	R phase Active Power	kW	2.49	Must Have
YPHV	Y phase voltage	Volts	231.45	Must Have
YPHI	Y phase current	Amp	11.50	Must Have
POWY	Y phase Active Power	kW	3.49	Must Have
BPHV	B phase voltage	Volts	232.45	Must Have
BPHI	B phase current	Amp	12.50	Must Have
POWB	B phase Active Power	kW	3.80	Must Have
POW	Total Active Power	kW	9.45	Must Have
TKWH	Today Generated Energy	kWh	99999999.99	Must Have
TON	Today ON Time of Inverter To convert Today running minutes into hours, simply divide by 60 $250/60 = 4.16$ Hrs.	Hrs.	11.15	Must Have
LKWH	Lifetime Generated Energy	kWh	99999999.99	Must Have
LON	Lifetime running hours To convert Today running minutes into hours, simply divide by 60 $250/60 = 4.16$ Hrs.	Hrs.	12.12	Must Have
TEMP	Inverter Temperature	Deg C	15.31	Must Have
FREQ	Frequency	Hz	49.89	Must Have
PF	Power Factor	-	0.85	Must Have
APOW	Apparent power	kVA	123.74	Must Have
RPOW	Reactive power	kVAr	456.23	Must Have
BCHTKWH	Today Battery Charge Energy from PV	kWh	99999999.99	Must have
BCHLKWH	Lifetime Battery Charge Energy from PPV	kWh	99999999.99	Must have
IMODE	Inverter Mode 1- Power Feed in the Grid 2- Importing Power from Grid 3- No Power Imported from Grid 4- Islanding Mode	-	1	Must have
BST	Battery Status Healthy : 1 Faulty : 2	-	1	Must Have
BCST	Charging Status Charging: 1 Discharging :2 Idle:3	-	2	Must Have
BDCV	Battery Voltage	DC V	58.24	Must Have
BDCI	Total Battery Current	DC I	15.12	Must Have
BCH%	%Battery Charge	%	90.75	Must Have
BHL%	% Battery Health	%	95.50	Must Have
BTEMP	Battery Temperature	Deg C	55.12	Must Have
BCV	Battery Charging Voltage	DC V	20.12	Must Have

BCC	Battery Charging current	Amp	15.12	Must Have
BWMOD	Working Mode 0: Self-consumption, 1: Peak shaving, 2: Battery Priority, 3: Load Shifting, 4: ToU Optimization, 5: Grid Support Mode, 6: PV Priority Mode, 7: Demand Response Mode	-	0	Good to Have
BDRT	Battery Discharging Rate	%	50.00	Good to Have
BDPWD	Battery Discharging Power Dispatching	%	15.50	Optional
BCHCTO%	Battery Charing Cut-off Capacity Range: 90 - 100 %	%	95.50	Must Have
BDCHCTO %	Battery Discharging Cut-Off Capacity 12 -20%	%	15.50	Must Have
FT1	Fault-1 Normal: 0 VAC High: 1 VAC Low: 2 Grid Voltage Fail: 3 Voltage un-balance: 4	-	1	Must Have
FT2	Fault-2 Normal :0 Frequency High: 1 Frequency Low: 2	-	2	Must Have
FT3	Fault-3 Normal :0 AC Output overload :1 PV Short Circuit :2 AC Short circuit fault: 3 Leakage Current High: 4	-	0	Must Have
FT4	Fault-4 Normal :0 High Temperature: 1	-	0	Must Have
FT5	Fault-5 Normal: 0 Other Fault: 1	-	1	Must Have

Annexure-5: Single Phase Energy Meter

Message Name	: Periodic Push Energy Meter Data
Message Format	: JSON
Message Type	: Data
Message Command Flow	: Not Applicable for Data periodic Push
Message response Flow Platform	: RMS -> CENTRALISED PLATFORM IoT
Message Medium	: Cellular (4G/5G fallback to 2G)
Keyword structure	: “{Part-1: Layer Identifier}- {Part-2: Parameter Identifier}”
Combined Sample Keyword	: MS-10-2-3- -POW (For Solar Meter)
	: MC-10-2-3- -POW (For Consumption Meter)
	: MN-10-2-3- -POW (For Net Meter)

Sample Keyword Part-2: Parameter Identifier	Sample Description	Sam ple Unit	Sample Sample Value	Sample Requirement in JSON												
VD	Virtual Device Index/Group	-	5	Must Have												
TIMESTAMP	RTC timestamp of RMS against all parameters of VD/group YYYY-MM-DD HH:MM: SS	-	2025-04-22 17:58:25	Must Have												
MAXINDEX	maximum index of local storage date	-	96	Must Have												
INDEX	reference of local storage	-	7	Must Have												
LOAD	Local storage retrieval command & status	-	0	Must Have												
STINTERVAL	Periodic interval at which RMS shall store and transmit data to server. (in minutes)	-	15	Must Have												
MSGID	Message Transaction Id - required for “Ondemand”/” Config” message type, request/response/acknowledgement/ feedback	-	10	Must Have												
DATE	local storage date YYMMDD	-	200518	Must Have												
IMEI	IMEI No. of First Sim to be considered always for unique identity of RMS	-	12345612345 6123	Must Have												
ASN_21	<table><tr><td colspan="2">Meter Serial Number</td></tr><tr><td>RMS</td><td>0</td></tr><tr><td>DAQ</td><td>1-9</td></tr><tr><td>-----</td><td>11-19</td></tr><tr><td>Meter</td><td>21-29</td></tr><tr><td>Inverter, String Inverter /String Combiner Box</td><td>31-50</td></tr></table>	Meter Serial Number		RMS	0	DAQ	1-9	-----	11-19	Meter	21-29	Inverter, String Inverter /String Combiner Box	31-50	-	21123450	Must Have
Meter Serial Number																
RMS	0															
DAQ	1-9															
-----	11-19															
Meter	21-29															
Inverter, String Inverter /String Combiner Box	31-50															
MTDET	Meter Detail		30012302	Must Have												
POTP	Previous One Time Password	-	341234	Must Have												
COTP	Current One Time Password	-	341234	Must Have												

MTBLDATE	Billing Date for meter 1		18	Must Have
DATE	Present date for meter1		180606	Must Have
TIME	Present time for meter1		105400	Must Have
VN	Phase to Neutral Voltage	Volts	245.25	Must Have
I	Phase Current	Amp	10.23	Must Have
POW	Active Power	kW	2.50	Must Have
RPOW	Reactive Power	kVAr	0.55	Must Have
APOW	Apparent Power	kVA	1.98	Good to Have
PF	Average PF	-	0.99	Must Have
FRQ	Grid Frequency	Hz	49.50	Must Have
KWHNET	Cumulative Net Energy	kWh	99999999.99	Good to Have
KWHIMP	Cumulative Import Energy	kWh	99999999.99	Must Have
KWHEXP	Cumulative Export Energy	kWh	99999999.99	Must Have
KVAHNET	Cumulative Net Energy	kVAh	99999999.99	Good to Have
KVAHIMP	Cumulative Import Energy	kVAh	99999999.99	Good to Have
KVAHEXP	Cumulative Export Energy	kVAh	99999999.99	Good to Have
MDKWIMP	Rising Demand (Import)	kW	11.12	Must Have
MDKWEXP	Rising Demand (Export)	kW	5.22	Must Have
POFF	Grid Power Failure in Minutes	Min	120	Must Have
TC	Total Tamper Counts	Nos	143	Good to Have
LBKWHNET	Last Billing Cycle Net Energy	kWh	99999999.99	Optional
LBKWHIMP	Last Billing Cycle Import Energy	kWh	99999999.99	Optional
LBKWHEXP	Last Billing Cycle Export Energy	kWh	99999999.99	Optional
PMDKVAIMP	Present MD KVA Import	kVA	22.55	Optional
PMDKVAEXP	Present MD KVA Export	kVA	0	Optional
LBMDKWIMP	Last Billing MD KW Import	kW	7.07	Optional
LBMDKWEXP	Last Billing MD KW Export	kW	0	Optional
LBMDKVAIMP	Last Billing MD KVA Import	kVA	7.07	Optional
LBMDKVAEXP	Last Billing MD KVA Export	kVA	0	Optional
MDRSTC	MD Reset Count	Nos	4	Optional

Annexure-6: Three Phase Energy Meter					
Message Name : Periodic Push Energy Meter Data					
Message Format : JSON					
Message Type : Data					
Message Command Flow : Not Applicable for Data periodic Push					
Message response Flow : RMS -> CENTRALISED PLATFORM IoT Platform					
Message Medium : Cellular (4G/5G fallback to 2G)					
Keyword structure : “{Part-1: Layer Identifier}- {Part-2: Parameter Identifier}”					
Combined Sample Keyword : MS-10-2-3--POW (For Solar Meter)					
: MC-10-2-3--POW (For Consumption Meter)					
: MN-10-2-3--POW (For Net Meter)					
Sample Keyword Part-2: Parameter Identifier	Sample Description	Sample Unit	Sample Value	Sample Requirement in JSON	
VD	Virtual Device Index/Group	-	5	Must Have	
TIMESTAMP	RTC timestamp of RMS against all parameters of VD/group YYYY-MM-DD HH:MM: SS	-	2025-04-22 17:58:25	Must Have	
MAXINDEX	maximum index of local storage date	-	96	Must Have	
INDEX	reference of local storage	-	7	Must Have	
LOAD	Local storage retrieval command & status	-	0	Must Have	
STINTERVAL	Periodic interval at which RMS shall store and transmit data to server. (in minutes)	-	15	Must Have	
MSGID	Message Transaction Id - required for “Ondemand”/” Config” message type, request/response/acknowledgement/ feedback	-	10	Must Have	
DATE	local storage date YYMMDD	-	200518	Must Have	
IMEI	IMEI No. of First Sim to be considered always for unique identity of RMS	-	123456123456 123	Must Have	
ASN_22	Meter Serial Number		-	33123450	Must Have
	RMS	0			
	DAQ	1-9			
	-----	11-19			
	Meter	21-29			
	Inverter, String Inverter /String Combiner Box	31-50			
MTDET	Meter Detail		30012302	Must Have	

POTP	Previous One Time Password	-	341234	Must Have
COTP	Current One Time Password	-	341234	Must Have
MTBLDATE	Billing Date for meter 1		18	Must Have
DATE	Present date for meter1	YYMMDD	180617	Must Have
TIME	Present time for meter1	HHMMSS	105400	Must Have
IR	R Phase Current	Amp	22.67	Must Have
IY	Y Phase Current	Amp	22.76	Must Have
IB	B Phase Current	Amp	22.34	Must Have
VRN	R Phase to Neutral Voltage	Volts	243.25	Must Have
VYN	Y Phase to Neutral Voltage	Volts	245.24	Must Have
VBN	B Phase to Neutral Voltage	Volts	242.65	Must Have
VRY	Phase to Phase Voltage(R-Y)	Volts	415.67	Must Have
VYB	Phase to Phase Voltage(Y-B)	Volts	419.23	Must Have
VBR	Phase to Phase Voltage(B-R)	Volts	417.89	Must Have
PFR	R Phase Power Factor	-	0.98	Must Have
PFY	Y Phase Power Factor	-	0.97	Must Have
PFB	B Phase Power Factor	-	0.98	Must Have
FRQ	Grid Frequency	Hz	50.01	Must Have
POWR	R Phase Active Power	kW	42.57	Must Have
POWY	Y Phase Active Power	kW	42.57	Must Have
POWB	B Phase Active Power	kW	42.57	Must Have
POW	Total Active Power	kW	122.57	Must Have
RPOWR	R Phase Reactive Power	kVAr	20.78	Good to Have
RPOWY	Y Phase Reactive Power	kVAr	20.78	Good to Have
RPOWB	B Phase Reactive Power	kVAr	20.78	Good to Have
RPOW	Total Reactive Power	kVAr	61.78	Must Have
APOWR	R Phase Apparent Power	kVA	52.78	Good to Have
APOWY	Y Phase Apparent Power	kVA	56.78	Good to Have
APOWB	B Phase Apparent Power	kVA	57.78	Good to Have
APOW	Total Apparent Power	kVA	158.123	Must Have
KWHNET	Cumulative Net Energy	kWh	99999999.99	Good to Have
KWHIMP	Cumulative Import Energy	kWh	99999999.99	Must Have
KWHEXP	Cumulative Export Energy	kWh	99999999.99	Must Have
KVAHNET	Cumulative Net Energy	kVAh	99999999.99	Must Have
KVAHIMP	Cumulative Import Energy	kWh	99999999.99	Must Have
KVAHEXP	Cumulative Export Energy	kWh	99999999.99	Must Have
MDKWIMP	Rising Demand (Import)	kW	456.78	Must Have
MDKWEXP	Rising Demand (Export)	kW	123.45	Must Have
POFF	Grid Power Failure in Minutes	Mins	120	Must Have
TC	Total Tamper Counts	Nos	143	Good to Have
PF	Average PF	-	0.98	Must Have
LBKWHNET	Last Billing Cycle Net Energy	kWh	99999999.99	Optional
LBKWHIMP	Last Billing Cycle Import Energy	kWh	99999999.99	Optional
LBKWHEXP	Last Billing Cycle Export Energy	kWh	99999999.99	Optional
PMDKVAIMP	Present MD KVA Import	kVA	22.55	Optional

PMDKVAEXP	Present MD KVA Export	kVA	1.23	Optional
LBMDKWIMP	Last Billing MD KW Import	kVA	7.07	Optional
LBMDKWEXP	Last Billing MD KW Export	kVA	1.05	Optional
LBMDKVAIMP	Last Billing MD KVA Import	kVA	7.07	Optional
LBMDKVAEXP	Last Billing MD KVA Export	kVA	1.34	Optional
MDRSTC	MD Reset Count	Nos	4	Optional

Annexure-7 String Combiner Box

Message Name : Periodic Push String Combiner Box
 Message Format : JSON
 Message Type : Data
 Message Command Flow : Not Applicable for Data periodic Push
 Message response Flow : RMS -> State CENTRALISED PLATFORM IoT Platform
 Message Medium : Cellular (4G/5G fallback to 2G)
 Keyword structure : "{Part-1: Layer Identifier}- {Part-2: Parameter Identifier}"
 Combined Sample Keyword : **S-99-21-1-1-I1**

Sample Keyword Part-2: Parameter	Sample Description	Sampl e Unit	Sample Value	Sample Requirement in JSON										
VD	Virtual Device Index/Group	-	9	Must Have										
TIMESTAMP	RTC timestamp of RMS against all parameters of VD/group YYYY-MM-DD HH:MM: SS	-	2025-07-07 02:08:55	Must Have										
MAXINDEX	maximum index of local storage date	-	96	Must Have										
INDEX	reference of local storage	-	7	Must Have										
LOAD	Local storage retrieval command & status	-	0	Must Have										
STINTERVAL	Periodic interval at which RMS shall store and transmit data to server. (in minutes)	-	15	Must Have										
MSGID	Message Transaction Id - required for “Ondemand”/” Config” message type, request/response/acknowledgement/ feedback	-	1	Must Have										
DATE	local storage date YYMMDD	-	200518	Must Have										
IMEI	IMEI No. of First Sim to be considered always for unique identity of RMS	-	1234561234 56123	Must Have										
ASN_41	DAQ Serial Number<table><tr><td>RMS</td><td>0</td></tr><tr><td>DAQ</td><td>1-9</td></tr><tr><td>-----</td><td>11-19</td></tr><tr><td>Meter</td><td>21-29</td></tr><tr><td>Inverter, String Inverter /String Combiner Box</td><td>31-50</td></tr></table>	RMS	0	DAQ	1-9	-----	11-19	Meter	21-29	Inverter, String Inverter /String Combiner Box	31-50	-	34123450	Must Have
RMS	0													
DAQ	1-9													
-----	11-19													
Meter	21-29													
Inverter, String Inverter /String Combiner Box	31-50													
POTP	Previous One Time Password	-	341234	Must Have										
COTP	Current One Time Password	-	341234	Must Have										
I1	SCB1, Channel1 Current	Amp	30.11	Must Have										

I2	SCB1, Channel2 Current	Amp	50.11	Must Have
I3	SCB1, Channel3 Current	Amp	40.11	Must Have
I4	SCB1, Channel4 Current	Amp	50.11	Must Have
I5	SCB1, Channel5 Current	Amp	50.11	Must Have
I6	SCB1, Channel6 Current	Amp	5.11	Must Have
I7	SCB1, Channel7 Current	Amp	5.11	Must Have
I8	SCB1, Channel8 Current	Amp	5.11	Must Have
IN	SCB1, Channel N Current (Up to N Channel)	Amp	5.11	Must Have
DCV	SCB1, DC Voltage	Volts	635.02	Must Have
DCTOTI	SCB1, Total DC Current	Amp	40.02	Must Have
DCTOTKW	SCB1, Total DC Power	kW	28.01	Must Have
DI1	SCB1, Digital Input1	-	1	Must Have
DI2	SCB1, Digital Input2	-	1	Must Have
T1	SCB1, Temperature1	Deg C	35.00	Must Have
T2	SCB1, Temperature2	Deg C	37.50	Must Have
T3	SCB1, Temperature3	Deg C	34.65	Must Have

Annexure-8 DAQ System					
Message Name : Periodic Push DAQ					
Message Format : JSON					
Message Type : Data					
Message Command Flow : Not Applicable for Data periodic Push					
Message response Flow : RMS -> CENTRALISED PLATFORM IoT Platform					
Message Medium : Cellular (4G/5G fallback to 2G)					
Keyword structure : "{Part-1: Layer Identifier}- {Part-2: Parameter Identifier}"					
Combined Sample Keyword : D-1-0- - -FDRST1					
Sample Keyword Part-2: Parameter Identifier	Sample Description		Sample Unit	Sample Value	Sample Requirement in JSON
VD	Virtual Device Index/Group		-	5	Must Have
TIMESTAMP	RTC timestamp of RMS against all parameters of VD/group YYYY-MM-DD HH:MM: SS		-	2025-04-22 17:58:25	Must Have
MAXINDEX	maximum index of local storage date		-	96	Must Have
INDEX	reference of local storage		-	7	Must Have
LOAD	Local storage retrieval command & status		-	0	Must Have
STINTERVAL	Periodic interval at which RMS shall store and transmit data to server. (in minutes)		-	15	Must Have
MSGID	Message Transaction Id - required for "Ondemand"/"Config" message type, request/response/acknowledgement/feedback		-	10	Must Have
DATE	local storage date (YYMMDD)		-	200518	Must Have
IMEI	IMEI No. of First Sim to be considered always for unique identity of RMS		-	12345612345613	Must Have
ASN_1	DAQ Serial Number		-	1123450	Must Have
	RMS	0			
	DAQ	1-9			
	-----	11-19			
	Meter	21-29			
	Inverter, String Inverter /String Combiner Box	31-50			

POTP	Previous One Time Password	-	341234	Must Have
COTP	Current One Time Password	-	341234	Must Have
MODTMP1	Module Temperature-1 (0-150)	Deg C	60.12	Must Have
MODTMP2	Module Temperature-2 (0-150)	Deg C	61.32	Good to Have
HUMDT	Humidity (0-100)	%	65.32	Good to Have
AMBTMP1	Ambient Temperature-1 (0-150)	Deg C	45.54	Must Have
AMBTMP2	Ambient Temperature-2 (0-150)	Deg C	46.64	Good to Have
RAING	Rain Gauge (0-50)	mm	23.34	Good to Have
POA1	Plan of Array Irradiation-1(0-2000)	w/m2	987.23	Must Have
POA2	Plan of Array Irradiation-2 (0-2000)	w/m2	902.34	Good to Have
GHI1	Global Horizontal Irradiation-1 (0-2000)	w/m2	876.45	Must Have
GHI2	Global Horizontal Irradiation-2 (0-2000)	w/m2	845.65	Good to Have
WDIR	Wind Direction (0-360)	Degree	120.43	Good to Have
WSPEED	Wind Speed (0-60)	m/s	23.45	Good to Have
YLDPOA1	Plan of Array 1 Radiation Yield (0-9999999)	kWh/m2	3423.34	Good to Have
YLDPOA2	Plan of Array 2 Radiation Yield (0-9999999)	kWh/m2	3245.23	Good to Have
YLDGHI1	Global Horizontal2 Radiation Yield (0-9999999)	kWh/m2	2789.34	Good to Have
YLDGHI2	Global Horizontal2 Radiation Yield (0-9999999)	kWh/m2	2867.23	Good to Have
DHRPOA1	POA-1 Day First Run Minutes To convert running seconds into Mins, simply divide by 60 $250/60 = 4.16$ Min.	Min	56.78	Must Have
THRPOA1	POA-1 Lifetime Run Minutes	Min	6537.45	Must Have
DHRPOA2	POA-2 Day First Run Minutes	Min	56.78	Good to Have
THRPOA2	POA-2 Lifetime Run Minutes	Min	6537.45	Good to Have
DHRGHI1	GHI-1 Day First Run Minutes	Min	45.56	Must Have
THRGHI1	GHI-1 Lifetime Run Minutes	Min	3545.45	Must Have
DHRGHI2	GHI-2 Day First Run Minutes	Min	45.56	Good to Have
THRGHI2	GHI-2 Lifetime Run Minutes	Min	3545.45	Good to Have
MCCBST1	DB MCCB1 Status: OFF-0, ON-1 (Similar for Up to N MCCB Status)	-	1	Good to Have
FDRST1	Feeder1 Status: OFF-0, ON-1 (Similar for Up to N Feeder Status)	-	1	Good to Have
TRPST1	Transformer1 HV Side Feeder Status: OFF-0, ON-1 (Similar for Up to N TR HV Status)	-	1	Good to Have
TRSST1	Transformer1 LV Side Feeder Status: OFF-0, ON-1 (Similar for Up to N TR LV Status)	-	1	Good to Have
LNST1	Line1 Feeder Status: OFF-0, ON-1 (Similar for Up to N Line Status)	-	1	Good to Have

Annexure-9 RMS					
Message Name : RMS Message Format : JSON Message Type : Heartbeat Message Command Flow : Not Applicable Message response Flow : RMS -> State CENTRALISED PLATFORM IoT Platform Message Medium : Cellular (4G/5G fallback to 2G) Keyword structure : “{Part-1: Layer Identifier}- {Part-2: Parameter Identifier}” Combined Sample Keyword : R-1-0- - -RSSI					
Sample Keyword Part-2: Parameter	Sample Description	Sample Unit	Sample Value	Sample Requirement in JSON	
VD	Virtual Device Index/Group	-	0	Must Have	
TIMESTAMP	RTC timestamp of RMS against all parameters of VD/group	-	5/18/2020 17:58:25	Must Have	
MAXINDEX	maximum index of local storage date	-	96	Must Have	
INDEX	reference of local storage	-	7	Must Have	
LOAD	Local storage retrieval command & status	-	0	Must Have	
STINTERVAL	Periodic interval at which RMS shall store and transmit data to server. (in minutes)	-	15	Must Have	
MSGID	Message Transaction Id - required for “Ondemand”/” Config” message type, request/response/acknowledgement/feedback	-	1	Must Have	
DATE	local storage date YYMMDD	-	250607	Must Have	
IMEI	IMEI No. of First Sim to be considered always for unique identity of RMS	-	123456123 4561234	Must Have	
ASN_0	RMS Serial Number		-	10123450	Must Have
	RMS	0			
	DAQ	1-9			
	-----	11-19			
	Meter	21-29			
	Inverter, String Inverter /String Combiner Box	31-50			
POTP	Previous One Time Password	-	341234	Must Have	
COTP	Current One Time Password	-	341243	Must Have	
GSM	Device connected to GSM network	-	1	Must Have	
SIM	SIM detected (1 - detected)	-	1	Must Have	
NET	Device in Network (1 - in network)	-	1	Must Have	
GPRS	GPRS connected (1 - connected)	-	1	Must Have	
RSSI	Signal Strength	-	22	Must Have	

SD	SD card detected (1 – detected,0-Not detected)	-	1	Good to Have
ONLINE	Device Online (1- Online, 0-Offline)	-	1	Must Have
RF	RF Module Status (1-ON,0-OFF)	-	1	Must Have
RTCDATE	RTC Date (YYMMDD)	-	180918	Must Have
RTCTIME	RTC Time (HHMMSS)	-	175800	Must Have
TEMP	RMS Device Temperature	Deg C	45.5	Must Have
LAT	Latitude (XX. XXXXXX)	-	19.066645	Good to Have
LONG	Longitude (XX. XXXXXX)	-	72.877865	Good to Have
SIMSLOT	Sim Slot (Current Sim Slot: 1 or 2)	-	1	Must Have
SIMCHNGCN	Total Sim Slot Change Count	-	10	Good to Have
FLASH	Device Flash Status 1: Detected 0: Error	-	1	Good to Have
BATTST	Battery Input Status: 1 if on battery power else 0	-	0	Optional
VBATT	Battery Voltage	Volts	5.5	Optional
PST	Power Supply (1-Mains, 2-Battery)	-	1	Optional

Annexure-10 Command & Control				
Message Name : On Demand Read/Write Parameter Message Format : JSON Message Type : Config/Ondemand Message Command Flow : Cloud Server -> RMS Message response Flow : RMS -> Cloud Server Message Medium : Cellular (4G/5G fallback to 2G) Keyword structure : "{Keyword Part-1 : Identifier}- {Keyword Part-2 Parameter}" Combined Sample Keyword : IG-10-2-3- -POWSP				
Sample Keyword Part-2: Parameter	Sample Description	Sample Unit	Sample Value	Sample Requirement in JSON
TIMESTAMP	RTC timestamp of RMS against all parameters of VD/group	-		Must Have
TYPE	config/ondemand	-		Must Have
CMD	write	-		Must Have
MSGID	Message Transaction Id - required for "Ondemand"/" Config" message type, request/response/acknowledgement/feedback	-		Must Have
VSP	Inverter Voltage Set Point	V	265.50	Good to Have For configuration
POWSP	Inverter Active Power Set Point	KW	25.50	Good to Have For configuration
POWSPPER	Inverter Active Power Limit Ratio (%)	%	100.00	Good to Have For configuration
RPOWSP	Inverter Reactive Power Set Point	KVAr	1.5	Good to Have For configuration
PFSP	Inverter Power Factor Set Point	-	0.98	Good to Have For configuration
INVCMD	Inverter Control 1 – ON, 2 – OFF, 3 – Emergency Shutdown	-	1	Good to Have For control
CBCHCTO	Charging Cut-off Capacity Range: 90 - 100 %	%	95.00	Good to Have For configuration
CBDCHCTO	Discharging Cut-Off Capacity Range: 12-20%	%	15.00	Good to Have For configuration
CIMODE	Hybrid Inverter Mode Control 1- Power Feed in the Grid 2- Importing Power from Grid	-	1	Good to Have For control

	3- No Power Imported from Grid 4- Islanding Mode			
CBCHDCH	Battery Charge/Discharge Command 1: Charge, 2: Discharge, 3: Stop	-	1	Good to Have For control
FDRONCMD1	Feeder1 On Command (Similar for Up to N Feeder)	-	1	Good to Have For control
FDROFFCMD1	Feeder1 OFF Command (Similar for Up to N Feeder)	-	1	Good to Have For control
TRPONCMD1	Transformer 1 Primary on Command (Similar for Up to N Transformer)	-	1	Good to Have For control
TRPOFFCMD1	Transformer 1 Primary Off Command (Similar for Up to N Transformer)	-	1	Good to Have For control
TRSONCMD1	Transformer 1 Secondary on Command (Similar for Up to N Transformer)	-	1	Good to Have For control
TRSOFFCMD1	Transformer 1 Secondary OFF Command (Similar for Up to N Transformer)	-	1	Good to Have For control
APN1	APN Value for sim1	-	m2misafe	Must Have For configuration
USR1	sim1 user name	-		Optional
PASS1	sim1 password	-		Optional
APN2	APN Value for sim2	-	m2misafe	Must Have For configuration
USR2	Sim2 user name	-		Optional
PASS2	Sim2 password	-		Optional
RESTART	To restart RMS, 1: Execute command	-		Must Have For control
UPDATE INTERVAL	Enter update interval in minutes.	-		Must Have For configuration
HEART INTERVAL	Heartbeat Update Interval in mins	-		Must Have For configuration
URTCDATE	RMS RTC Date (YYMMDD) Update RMS RTC Time (HH:MM: SS) Update	-		Must Have For configuration
URTCIME	RMS RTC Time (HH:MM: SS) Update - 24-hour format	-		Must Have For configuration
UPDATERTC	Update RTC, 1: Execute command, 0 : Successful execution	-		Must Have For configuration
GSMSYNC	RTC auto GSM synchronization, 1: to execute command	-		Must Have For configuration

AI1ZERO	Engineering Zero Value (4 mA dc) for AI1 E.G. 0(LPM)	-		Must Have For configuration
AI1SPAN	Engineering Span Value (20 mA dc) for AI1 E.G. 5000(LPM)	-		Must Have For configuration
URL	URL of Device Management Server	-		Must Have For configuration
PORT	Port of Device Management Server	-		Must Have For configuration
CID	Unique Client id of device	-		Must Have For configuration
USERNAME	Username for device authentication	-		Must Have For configuration
PASSWORD	Password for device authentication	-		Must Have For configuration
FTPUURL	URL for FTP	-		Must Have For configuration
FTPUSER	Username for FTP	-		Must Have For configuration
FTPPASS	Password for FTP	-		Must Have For configuration
FTPSPORT	Port for FTP	-		Must Have For configuration
FTPDOWN	Download Certificates from ftp 1: To execute command, 0: Command is successfully executed	-		Must Have For configuration

Annexure-11: Sample JSON Format of Annexure-1 (Single Phase-String Inverter (IS))

```
{
  "VD":5,
  "TIMESTAMP":"2025-07-07 17:58:29",
  "MAXINDEX": 72,
  "INDEX":72,
  "LOAD": 0,
  "STINTERVAL":15,
  "MSGID": "",
  "DATE": 250707,
  "IMEI": "123456789101112",
  "ASN_32":34123450,
  "POTP":123412,
  "COTP":412345,
  "IS-10-2-3--IST":1,
  "IS-10-2-3--DCV1":500.25,
  "IS-10-2-3--DCI1":200.12,
  "IS-10-2-3--DCKW1":200.12,
  "IS-10-2-3--RPHV":230.45,
  "IS-10-2-3--RPHI":10.5,
  "IS-10-2-3--POWR":2.49,
  "IS-10-2-3--YPHV":231.45,
  "IS-10-2-3--YPHI":11.5,
  "IS-10-2-3--POWY":3.49,
  "IS-10-2-3- -BPHV":232.45,
  "IS-10-2-3--BPHI":12.5,
  "IS-10-2-3--POWB":3.8,
  "IS-10-2-3--POW":9.45,
  "IS-10-2-3--TKWH":99999999.99,
  "IS-10-2-3--TON":11.15,
  "IS-10-2-3--LKWH":99999999.99,
  "IS-10-2-3--LON":12.12,
  "IS-10-2-3--TEMP":15.31,
  "IS-10-2-3--FREQ":49.89,
  "IS-10-2-3--PF":0.85,
  "IS-10-2-3--APOW":123.74,
  "IS-10-2-3--RPOW":456.23,
  "IS-10-2-3--FT1":1,
  "IS-10-2-3--FT2":2,
  "IS-10-2-3--FT3":0,
  "IS-10-2-3--FT4":0,
  "IS-10-2-3--FT5":1
}
```

Annexure-12: Sample JSON Format of Annexure-10 (Command & Control)

Command Message: Inverter "OFF" Command from CENTRALISED PLATFORM IoT Platform to RMS

```
{  
  "TIMESTAMP":"2025-07-07 17:58:29",  
  "TYPE":"ondemand",  
  "CMD":"write",  
  "MSGID":"23134",  
  "IG-10-2-3--INVCMD":2          //2-OFF  
}
```

Response Message: RMS to CENTRALISED PLATFORM IoT Platform

```
{  
  "TIMESTAMP":"2025-07-07 17:58:35",  
  "TYPE":"ondemand",  
  "CMD":"write",  
  "MSGID":"23134",          //MSGID must be same as Command Message  
  "IG-10-2-3--INVCMD":2  
}
```