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-rts@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

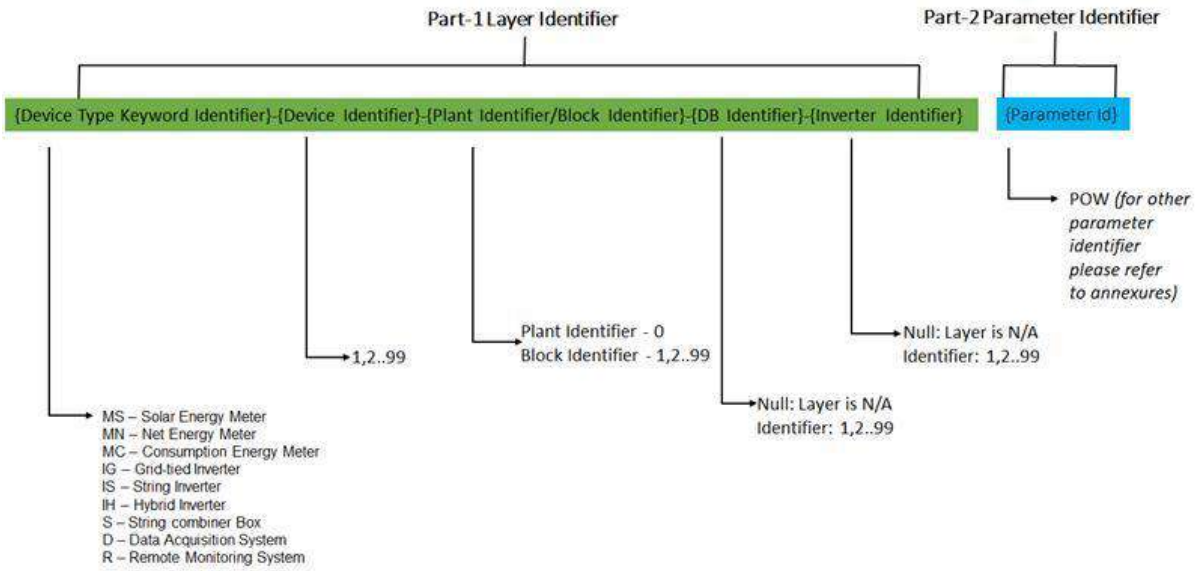
- **Push on Periodic Interval:** In this mode deployed RMS shall transmit data of Multiple devices and sensors on different configurable time intervals such as Inverter at every 5 minutes, Energy Meter data at every 15 minutes, String Combiner Box data at every 10 minutes
- **Push on Event:** RMS shall 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 5th String combiner box of 2nd inverter of 1st DB of 2nd Block *(With DB)*	S-5-2-1-2-POW
Total Active Power of 5th String combiner box of 2nd inverter of 2nd Block *(Without DB)*	S-5-2- -2-POW *As DB layer is not mentioned, DB id is not included so Null value between two hyphens to be mentioned.*
Total Active Power of 2nd Grid tied Inverter of 3rd DB of 2nd Block *(With DB)*	IG-2-2-3- -POW *As this parameter belong to inverter so no need of duplicating inverter identifier. So Null value between two hyphens to be mentioned.*
Total Active Power of 3rd Grid tied Inverter of 2nd Block *(Without DB)*	IG-3-2- - -POW *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*
Total Active Power of 95th Hybrid Inverter of the plant	IH-95-0- - -POW
Total Active Power of 7th Net Energy meter of entire plant	MN-7-0- - -POW
Total Active Power of 3rd Solar Energy meter of 1st Block	MS-3-1- - -POW
Total Active Power of 9th Consumption Energy Meter of 1st block of 2nd 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.

<table>
<tr><th>Sample Keyword</th><th>Sample Description</th><th>Sample Value</th><th></th></tr>
<tr><td>IMEI</td><td>Unique Identification of RMS – required to ensure registered source of data</td><td>863287049443888</td><td rowspan="14">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</td></tr>
<tr><td>VD</td><td>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><th>Example of Virtual Device Number (say)</th><th>Device Type</th></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></td><td>2</td></tr>
<tr><td>MSGID</td><td>Message Transaction Id - required for “Ondemand”/ “Config” message type, request/response/acknowledgement/feedback</td><td>123456789</td></tr>
<tr><td>COMMAND</td><td>Read/Write - Applicable only in case of “Ondemand”/ “Config” message Type</td><td>Read</td></tr>
<tr><td>TIMESTAMP</td><td>RTC timestamp of RMS against all parameters of VD / group (YYYY-MM-DD HH:MM: SS)</td><td>“2019-08-20 20:15:08”</td></tr>
<tr><td>STINTERVAL</td><td>Periodic interval at which RMS shall store and transmit data to the server. (in minutes)</td><td>15</td></tr>
<tr><td>DATE</td><td>local storage date – required as a reference to fetch data from local storage (YYMMDD)</td><td>220616</td></tr>
<tr><td>INDEX</td><td>Local storage Index – required as a reference to fetch data from local storage</td><td>5</td></tr>
<tr><td>MAXINDEX</td><td>Local storage maximum index of local storage date – required to calculate missing index</td><td>96</td></tr>
<tr><td>LOAD</td><td>Local storage retrieval command & status</td><td>0</td></tr>
<tr><td>POTP</td><td>Previous One Time Password</td><td>123456</td></tr>
<tr><td>COTP</td><td>Current One Time Password, National/State Server will update OTP at interval of 30/60 minutes</td><td>123456</td></tr>
<tr><td>Parameter-1
Parameter-2
Parameter-3
Parameter-1
……..
Parameter-n</td><td>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.</td><td></td><td></td></tr>
</table>

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 RMS: 0 DAQ: 1-9 ----------: 11-19 Meter: 21-29 Inverter, String Inverter /String Combiner Box: 31-50	-	31123450	Must Have
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 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	Inverter Serial Number RMS: 0 DAQ: 1-9 ----------: 11-19 Meter: 21-29 Inverter, String Inverter /String Combiner Box: 31-50	-	34123450	Must Have
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 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_33	Inverter Serial Number RMS: 0 DAQ: 1-9 ----------: 11-19 Meter: 21-29 Inverter, String Inverter /String Combiner Box: 31-50	-	33123450	Must Have
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 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-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 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 RMS: 0 DAQ: 1-9 ----------: 11-19 Meter: 21-29 Inverter, String Inverter /String Combiner Box: 31-50	-	34123450	Must Have
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