Neware Battery Testing System
BTSAPI Protocol
Version 1.12

NEWARE TECHNOLOGY LIMITED

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Update by Chris Chen on October 18, 2021.

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1 BTSAPI Communication Protocol

1.1 BTS Client Communication Protocol

This is communication protocol between BTS client and other software application,data was transferred via file pipe between BTS client and other software application.

Packet	
Data	End
Different information type, different parameter.	

Definition:
<?xml version="1.0" encoding="UTF-8" ?>
<bts>
</bts>
\n\n
Each protocol is ending by judging the neighbouring line break.

Other software want to control neware software, should operate as below steps:

1, Creat file pipe, open the file pipe on server, named "\\.\pipe\NewareBtsAPI", the file pipe name is UNICODE,and should be run under administrator rights. Because Neware software should be operated under administrator.
2, Communicating by XML protocol.The content format should be UTF-8 when send or receive.
3, Communication process:first you have to connect by using "connect",then you can communication with other order.Make sure all content should be identical to the file, including capital and lower case.
4, This protocol is a way of Q/A to communicate, so it should be received the reply then send the next order.

1.1.1 Connect (connect)

```
<?xml version="1.0" encoding="UTF-8" ?>
<bts version="1.0">
        <cmd>connect</cmd>
        <username>test</username>
        <password>123</password>
        <type>bfgs</type>
</bts>
\n\n
```

instruction:

tag	function	instruction
bts version	Protocol version	1.0 version now
cmd	Command Identifier	connect: connect command
username	User name	Login user name
password	User password	Password will be provide by neware
type	Application type	BTS client provide different function depends on different application type.(e.g.it can not called to corresponding API if limited.) Bfgs: means formation & grading test

		Autotest: means automatic test

Connect respond (connect_resp)

```
<?xml version="1.0" encoding="UTF-8" ?>
<bts version="1.0">
        <cmd>connect_resp</cmd>
        <result>ok</result>
</bts>
\n\n
```

instruction:

Tag	Function	Instruction
bts version	Protocol version	1.0 version now
cmd	Command Identifier	connect_resp:connect command respond
result	Result	1.ok 2.fail
desc	Description of failure	Show the reason of failure

1.1.2 Get device information(getdevinfo)

```
<?xml version="1.0" encoding="UTF-8" ?>
<bts version="1.0">
        <cmd>getdevinfo</cmd>
</bts>
\n\n
```

instruction:

Tag	Function	Instruction
bts version	Protocol version	1.0 version now
cmd	Command Identifier	getdevinfo:get device information command

Get device information respond (getdevinfo_resp)

```
<?xml version="1.0" encoding="UTF-8" ?>
<bts version="1.0">
        <cmd>getdevinfo_resp</cmd>
        <serverip count = "4">
                <server ip="192.168.1.33" port="3306"/>
                <server ip="192.168.1.34" port="3306"/>
                <server ip="192.168.1.35" port="3306"/>
                <server ip="192.168.1.36" port="3306"/>
        </serverip>
        <middle count = "16">
                <channel ip="192.168.1.35" devtype="22" devid="1" subdevid="1" Channelid="1">true</channel>
                <channel ip="192.168.1.35" devtype="22" devid="1" subdevid="2" Channelid="2">true</channel>
                <channel ip="192.168.1.36" devtype="22" devid="1" subdevid="3" Channelid="3">true</channel>
                <channel ip="192.168.1.36" devtype="22" devid="1" subdevid="3" Channelid="1">true</channel>
                <channel ip="192.168.1.36" devtype="22" devid="1" subdevid="3" Channelid="2">true</channel>
                <channel ip="192.168.1.36" devtype="22" devid="1" subdevid="3" Channelid="3">true</channel>
                <channel ip="192.168.1.36" devtype="22" devid="1" subdevid="3" Channelid="4">true</channel>
                <channel ip="192.168.1.36" devtype="22" devid="1" subdevid="3" Channelid="5">true</channel>
```


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```
                <channel ip="192.168.1.36" devtype="22" devid="1" subdevid="3" Channelid="6">true</channel>
                <channel ip="192.168.1.36" devtype="22" devid="1" subdevid="3" Channelid="7">true</channel>
                <channel ip="192.168.1.36" devtype="22" devid="1" subdevid="3" Channelid="8">true</channel>
                <channel ip="192.168.1.36" devtype="22" devid="1" subdevid="3" Channelid="1">true</channel>
                <channel ip="192.168.1.36" devtype="22" devid="1" subdevid="3" Channelid="2">true</channel>
                <channel ip="192.168.1.36" devtype="22" devid="1" subdevid="3" Channelid="3">true</channel>
                <channel ip="192.168.1.36" devtype="22" devid="1" subdevid="3" Channelid="4">true</channel>
        </middle>
</bts>
\n\n
```

instruction:

Tag	Function	Instruction
bts version	Protocol version	1.0 version now
cmd	Command Identifier	getdevinfo_resp:get device information respond command
serverip	Server list	count:number of server
server	Server information	1.ip 2.port
middle	The middle machine connected now	count:number of middle machine
channel	Single channel information	devtype:device type (“22”means 8.0type; “21”means 79 type, “20”means 7.8 type) devid:device ID subdevid:unit ID chlid:channel ID true:Means the channel can be shown green light. false:Means the channel can not be lighted.

1.1.3 light

```
<?xml version="1.0" encoding="UTF-8" ?>
<bts version="1.0">
        <cmd>light</cmd>
        <list count = "8">
                <light ip="127.0.0.3" devtype="22" devid="3" subdevid="2" chlid="17">true</light>
                <light ip="127.0.0.2" devtype="22" devid="3" subdevid="1" chlid="13">true</light>
                <light ip="127.0.0.1" devtype="22" devid="3" subdevid="1" chlid="3">false</light>
                <light ip="127.0.0.1" devtype="22" devid="3" subdevid="1" chlid="4">true</light>
                <light ip="127.0.0.1" devtype="22" devid="3" subdevid="1" chlid="5">true</light>
                <light ip="127.0.0.1" devtype="22" devid="3" subdevid="3" chlid="6">true</light>
                <light ip="127.0.0.1" devtype="22" devid="3" subdevid="1" chlid="7">true</light>
                <light ip="127.0.0.1" devtype="22" devid="3" subdevid="3" chlid="8">true</light>
        </list>
</bts>
\n\n
```

instruction:

Tag	Function	instruction
bts version	Protocol version	1.0 version now

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cmd	Command Identifier	Light: light command
list	Light list	count:number of light
light	Single light information	ip: server IP devtype:device type devid:device ID subdevid:unit ID chlid:channel ID true:means light green light false:means lights out

Light information respond(light_resp)

```
<?xml version="1.0" encoding="UTF-8" ?>
<bts version="1.0">
        <cmd>light_resp</cmd>
        <list count = "8">
                <light ip="127.0.0.1" devtype="22" devid="3" subdevid="2" chlid="8">ok</light>
                <light ip="127.0.0.1" devtype="22" devid="3" subdevid="1" chlid="6">ok</light>
                <light ip="127.0.0.1" devtype="22" devid="3" subdevid="1" chlid="3">ok</light>
                <light ip="127.0.0.1" devtype="22" devid="3" subdevid="1" chlid="4">ok</light>
                <light ip="127.0.0.1" devtype="22" devid="3" subdevid="1" chlid="5">ok</light>
                <light ip="127.0.0.1" devtype="22" devid="3" subdevid="3" chlid="6">ok</light>
                <light ip="127.0.0.1" devtype="22" devid="3" subdevid="1" chlid="7">ok</light>
                <light ip="127.0.0.1" devtype="22" devid="3" subdevid="3" chlid="8">ok</light>
                <light ip="127.0.0.1" devtype="22" devid="3" subdevid="3" chlid="8">false</light>

        </list>
</bts>
\n\n
```

instruction:

tag	function	instruction
bts version	Protocol version	1.0 version now
cmd	Command Identifier	light_resp:Light information respond Command
list	Light list	count:the number of successful lighting
light	Channel information	ip:server IP devtype:device type devid: device ID subdevid:unit ID chlid:channel ID ok:means lighting successfully false:means lighting failure

1.1.4 Start(start)

```
<?xml version="1.0" encoding="UTF-8" ?>
<bts version="1.0">
        <cmd>start</cmd>
        <list count = "3" DBC_CAN="1">
              <start ip="127.0.0.3" devtype="22" devid="3" subdevid="2" chlid="1" barcode="D672035TAA131" >c:/工步文件名称.xml</start>
              <start ip="127.0.0.3" devtype="22" devid="3" subdevid="2" chlid="2" barcode="D672035TAA132" >c:/工步文件名称.xml</start>
              <start ip="127.0.0.3" devtype="22" devid="3" subdevid="2" chlid="3" barcode="D672035TAA133" >c:/工步文件名称.xml</start>
             <backup backupdir="D:\temp\backup" remotedir="" filenametype="1" customfilename="" addtimewhenrepeat="0" createdirbydate="0"
        filetype="1" backupontime="0" backupontimeinterval="720" backupfree="0" />
```


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```
        </list>
</bts>
\n\n
```

instruction:

tag	function	instruction
bts version	Protocol version	1.0 version now
cmd	Command Identifier	start: start command
list	Start list of channel	count:Number of start channel
DBC_CAN	DBC step specify CAN ID	
start	Single start channel information	ip:server IP devtype:device type devid:device ID subdevid:unit ID chlid:channel ID c:\step name.xml:step file path

Start respond(start_resp)

```
<?xml version="1.0" encoding="UTF-8" ?>
<bts version="1.0">
        <cmd>start_resp</cmd>
        <list count = "3">
                <start ip="127.0.0.1" devtype="22" devid="3" subdevid="2" chlid="8">ok</start>
                <start ip="127.0.0.1" devtype="22" devid="3" subdevid="1" chlid="6">ok</start>
                <start ip="127.0.0.1" devtype="22" devid="3" subdevid="1" chlid="3">ok</start>
        </list>
</bts>
\n\n
```

instruction:

tag	function	instruction
bts version	Protocol version	1.0 version now
cmd	Command Identifier	start_resp:start respond command
list	Start list of channel	count:number of start
start	Channle information	ip:server IP devtype:device type devid:device ID subdevid:unit ID chlid:channel ID ok false

1.1.5 Get channel status information(getchlstatus)

```
<?xml version="1.0" encoding="UTF-8" ?>
<bts version="1.0">
        <cmd>getchlstatus</cmd>
        <list count = "11">
                <status ip="127.0.0.1" devtype="22" devid="3" subdevid="2" chlid="1">true</status>
                <status ip="127.0.0.1" devtype="22" devid="3" subdevid="2" chlid="12">true</status>
                <status ip="127.0.0.1" devtype="22" devid="3" subdevid="2" chlid="2">true</status>
                <status ip="127.0.0.1" devtype="22" devid="3" subdevid="2" chlid="14">true</status>
```


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```
                <status ip="127.0.0.1" devtype="22" devid="3" subdevid="2" chlid="16">true</status>
                <status ip="127.0.0.1" devtype="22" devid="3" subdevid="2" chlid="8">true</status>
                <status ip="127.0.0.1" devtype="22" devid="3" subdevid="2" chlid="17">true</status>
                <status ip="127.0.0.1" devtype="22" devid="3" subdevid="2" chlid="13">true</status>
                <status ip="127.0.0.1" devtype="22" devid="3" subdevid="2" chlid="5">true</status>
                <status ip="127.0.0.1" devtype="22" devid="3" subdevid="2" chlid="6">true</status>
                <status ip="127.0.0.1" devtype="22" devid="3" subdevid="2" chlid="9">true</status>
        </list>
</bts>
\n\n
```

instruction:

tag	function	instruction
bts version	Protocol version	1.0 version now
cmd	Command Identifier	getchlstatus: get channel status command
list	List of channel	count:number of channel
status	Single channel information	ip:server IP devtype:device type devid:device ID subdevid:unit ID chlid:channel ID true: get

Get channel status information respond(getchlstatus_resp)

```
<?xml version="1.0" encoding="UTF-8" ?>
<bts version="1.0">
        <cmd>getchlstatus_resp</cmd>
        <list count = "11">
                <status ip="127.0.0.1" devtype="22" devid="3" subdevid="2" chlid="8">working</status>
                <status ip="127.0.0.1" devtype="22" devid="3" subdevid="1" chlid="6">stop</status>
                <status ip="127.0.0.1" devtype="22" devid="3" subdevid="1" chlid="3">finish</status>
                <status ip="127.0.0.1" devtype="22" devid="3" subdevid="1" chlid="4">protect</status>
                <status ip="127.0.0.1" devtype="22" devid="3" subdevid="1" chlid="5">pause</status>
                <status ip="127.0.0.1" devtype="22" devid="3" subdevid="3" chlid="6">pause</status>
                <status ip="127.0.0.1" devtype="22" devid="3" subdevid="1" chlid="7">finish</status>
                <status ip="127.0.0.1" devtype="22" devid="3" subdevid="3" chlid="8">stop</status>
                <status ip="127.0.0.1" devtype="22" devid="3" subdevid="3" chlid="8">finish</status>
                <status ip="127.0.0.1" devtype="22" devid="3" subdevid="1" chlid="4">protect</status>
                <status ip="127.0.0.1" devtype="22" devid="3" subdevid="1" chlid="4">protect</status>
                <status ip="127.0.0.1" devtype="22" devid="3" subdevid="1" chlid="4">protect</status>
        </list>
</bts>
\n\n
```

instruction:

tag	function	instruction
bts version	Protocol version	1.0 version now
cmd	Command Identifier	getchlstatus_resp:get channel status respond command
list	List of channel	count:number of channel
status	Single channel information	ip:server IP devtype:device type devid:device ID subdevid:unit ID chlid:channel ID working\stop\finish\protect\pause:channel status false: inexistence

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1.1.6 Stop(stop)

```
<?xml version="1.0" encoding="UTF-8" ?>
<bts version="1.0">
        <cmd>stop</cmd>
        <list count = "11">
                <stop ip="127.0.0.3" devtype="22" devid="3" subdevid="2" chlid="1">true</stop>
                <stop ip="127.0.0.3" devtype="22" devid="3" subdevid="2" chlid="12">true</stop>
                <stop ip="127.0.0.3" devtype="22" devid="3" subdevid="2" chlid="2">true</stop>
                <stop ip="127.0.0.3" devtype="22" devid="3" subdevid="2" chlid="14">true</stop>
                <stop ip="127.0.0.3" devtype="22" devid="3" subdevid="2" chlid="16">true</stop>
                <stop ip="127.0.0.3" devtype="22" devid="3" subdevid="2" chlid="8">true</stop>
                <stop ip="127.0.0.3" devtype="22" devid="3" subdevid="2" chlid="17">true</stop>
                <stop ip="127.0.0.3" devtype="22" devid="3" subdevid="2" chlid="13">true</stop>
                <stop ip="127.0.0.3" devtype="22" devid="3" subdevid="2" chlid="5">true</stop>
                <stop ip="127.0.0.3" devtype="22" devid="3" subdevid="2" chlid="6">true</stop>
                <stop ip="127.0.0.3" devtype="22" devid="3" subdevid="2" chlid="9">true</stop>
        </list>
</bts>
\n\n
```

instruction:

tag	function	instruction
bts version	Protocol version	1.0 version now
cmd	Command Identifier	stop: stop command
list	List of channel	count:number of channel
stop	Single channel information	ip:server IP devtype:device type devid:device ID subdevid:unit ID chlid:channel ID true:stop false:not stop

Stop information respond(stop_resp)

```
<?xml version="1.0" encoding="UTF-8" ?>
<bts version="1.0">
        <cmd>stop_resp</cmd>
        <list count = "11">
                <stop ip="127.0.0.1" devtype="22" devid="3" subdevid="2" chlid="8">ok</stop>
                <stop ip="127.0.0.1" devtype="22" devid="3" subdevid="1" chlid="6">ok</stop>
                <stop ip="127.0.0.1" devtype="22" devid="3" subdevid="1" chlid="3">ok</stop>
                <stop ip="127.0.0.1" devtype="22" devid="3" subdevid="1" chlid="4">ok</stop>
                <stop ip="127.0.0.1" devtype="22" devid="3" subdevid="1" chlid="5">ok</stop>
                <stop ip="127.0.0.1" devtype="22" devid="3" subdevid="3" chlid="6">ok</stop>
                <stop ip="127.0.0.1" devtype="22" devid="3" subdevid="1" chlid="7">ok</stop>
                <stop ip="127.0.0.1" devtype="22" devid="3" subdevid="3" chlid="8">ok</stop>
                <stop ip="127.0.0.1" devtype="22" devid="3" subdevid="3" chlid="8">ok</stop>
                <stop ip="127.0.0.1" devtype="22" devid="3" subdevid="1" chlid="4">ok</stop>
                <stop ip="127.0.0.1" devtype="22" devid="3" subdevid="1" chlid="4">ok</stop>
                <stop ip="127.0.0.1" devtype="22" devid="3" subdevid="1" chlid="4">false</stop>
        </list>
</bts>
\n\n
```

instruction:

tag	function	instruction
bts version	Protocol version	1.0 version now

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cmd	Command Identifier	stop_resp:Stop respond command
list	List of channel	count:number of channel
stop	Single channel information	ip:server IP devtype:device type devid:device ID subdevid:unit ID chlid:channel ID ok:already send stop command false: stop command not to send

1.1.7 Download DF data(download)

```
<?xml version="1.0" encoding="UTF-8" ?>
<bts version="1.0">
        <cmd>download</cmd>
        <download  devtype="24" devid="1" subdevid="1" chlid="1" auxid="0" testid="0" startpos="1" count="1000"/>
</bts>
\n\n
```

instruction:

tag	function	instruction
bts version	Protocol version	1.0 version now
cmd	Command Identifier	download: download data command
download	Download channel information Support download one channel information at same time	Only download testing data under 127.0.0.1 server devtype:device type devid:device ID subdevid:unit ID chlid:channel ID auxid:aux channel ID testid:test id，means current test startpos:starting of data ID count: The limit of maximum download data is 1000 in one time,otherwise it will be download several times.

Download DF data respond(download_resp)

```
<?xml version="1.0" encoding="UTF-8" ?>
<bts version="1.0">
        <cmd>download_resp</cmd>
        <download  devtype="24" devid="1" subdevid="1" chlid="1" testid="0" startpos="1" count="1000"/>
        <list count = "2">
        <data seqid="1" stepid="1" cycleid="1" steptype="cc" testtime="1000" atime="2019-08-07 11.48.23"
                volt="3.5" curr="1.2" cap="0.1" eng="0.35" temp="28.2">
            <DBC message_name="BMS_Frame08" signal_name="Local_PowerLock" signal_remark="" value="1" unit="" />
            <DBC message_name="BMS_Frame08" signal_name="Local_LecuPower" signal_remark="" value="2" unit="" />
            <DBC message_name="BMS_Frame08" signal_name="Local_Output_N1" signal_remark="" value="3" unit="" />
            </data>
        <data seqid="2" stepid="1" cycleid="1" steptype="cc" testtime="1000" atime="2019-08-07 11.48.23"
              volt="3.5" curr="1.2" cap="0.2" eng="0.69" temp="28.3">
            <DBC message_name="BMS_Frame08" signal_name="Local_PowerLock" signal_remark="" value="1" unit="" />
            <DBC message_name="BMS_Frame08" signal_name="Local_LecuPower" signal_remark="" value="2" unit="" />
```


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```
            <DBC message_name="BMS_Frame08" signal_name="Local_Output_N1" signal_remark="" value="3" unit="" />
            </data>

        </list>
</bts>
\n\n
```

instruction:

tag	function	instruction
bts version	Protocol version	1.0 version now
cmd	Command Identifier	download_resp:Download data respond
download	Channel information	devtype:device type devid:device ID subdevid:unit ID chlid:channel ID testid:test id startpos:starting of data ID count:The maximum numbers of current download data
list	Numbers of data	
data	DF data information	seqid:data sequence ID stepid:step ID cycleid:cycle ID steptype:step type testtime: current test time, unit “ms” atime:absolutely time volt:voltage，unit “V” curr:current，unit “A” cap:capacity，unit “Ah” eng: energy，unit “Wh” Temp:temperture，unit “℃”，valid when you have aux channel
DBC	DBC parameter	message_name: message name signal_name: signal name signal_remark: remark value: value unit: unit

1.1.8 inquire real-time data(inquire)

```
<?xml version="1.0" encoding="UTF-8" ?>
<bts version="1.0">
        <cmd>inquire</cmd>
        <list count = "8">
            <inquire ip="127.0.0.3" devtype="22" devid="3" subdevid="2" chlid="1" aux=”29” barcode=”1”>true</inquire>
            <inquire ip="127.0.0.3" devtype="22" devid="3" subdevid="2" chlid="2" aux=”30” barcode=”1”>true</inquire>
            <inquire ip="127.0.0.3" devtype="22" devid="3" subdevid="2" chlid="3" aux=”0” barcode=”1”>true</inquire>
            <inquire ip="127.0.0.3" devtype="22" devid="3" subdevid="2" chlid="4" aux=”11” barcode=”1”>true</inquire>
            <inquire ip="127.0.0.3" devtype="22" devid="3" subdevid="2" chlid="5" aux=”31” barcode=”1”>true</inquire>
            <inquire ip="127.0.0.3" devtype="22" devid="3" subdevid="2" chlid="6" aux=”23” barcode=”1”>true</inquire>
            <inquire ip="127.0.0.3" devtype="22" devid="3" subdevid="2" chlid="7" aux=”22” barcode=”1”>true</inquire>
            <inquire ip="127.0.0.3" devtype="22" devid="3" subdevid="2" chlid="8" aux=”20” barcode=”1”>true</inquire>
        </list>
</bts>
\n\n
```


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instruction:

tag	function	instruction
bts version	Protocol version	1.0 version now
cmd	Command Identifier	inquire: inquire real-time data command
list	Channel list	count: The numbers of channels
inquire	Single channel information	ip:server IP devtype:device type devid:device ID subdevid:unit ID chlid:channel ID aux:auxiliary channel(“0” means main channel，other value means auxiliary channel) Barcode: if no barcode, then igonore it, or it will consume a lot of resource. true: inquire false:not to inquire

inquire real-time data respond(inquire_resp)

```
<?xml version="1.0" encoding="UTF-8" ?>
<bts version="1.0">
        <cmd>inquire_resp</cmd>
        <list count = "8">
            <inquire dev="22-3-2-1-10" cycle_id= "1" step_id="1" step_type="cc" workstatus=”stop” barcode=”G48100230100” current="1" voltage="2"
                capacity="100" energy="10" totaltime=”3090909” relativetime=”7230910” auxtemp=”20” auxvol=”1” open_or_close=”0”/>
            <inquire dev="22-3-2-2-30" cycle_id= "1" step_id="1" step_type="cccv" workstatus=”stop” barcode=”G48100230101” current="1"
                voltage="2"capacity="100" energy="10" totaltime=”3090909” relativetime=”7230910” auxtemp=”20” auxvol=”1” open_or_close=”0”/>
            <inquire dev="22-3-2-3-28" cycle_id= "1" step_id="1" step_type="cc" workstatus=”stop” barcode=”” current="1" voltage="2" capacity="100" energy="10"
                totaltime=”3090909” relativetime=”7230910” auxtemp=”20” auxvol=”1” open_or_close=”1”/>
            <inquire dev="22-3-2-4-20" cycle_id= "1" step_id="1" step_type="cc" workstatus=”stop” barcode=”” current="1" voltage="2" capacity="100" energy="10"
                totaltime=”3090909” relativetime=”7230910” auxtemp=”20” auxvol=”1” open_or_close=”0”/>
            <inquire dev="22-3-2-5-11" cycle_id= "1" step_id="1" step_type="cc" workstatus=”stop” barcode=”” current="1" voltage="2" capacity="100" energy="10"
                totaltime=”3090909” relativetime=”7230910” auxtemp=”20” auxvol=”1” open_or_close=”0”/>
            <inquire dev="22-3-2-6-12" cycle_id= "1" step_id="1" step_type="cccv" workstatus=”stop” barcode=”” current="1" voltage="2" capacity="100"
                energy="10" totaltime=”3090909” relativetime=”7230910” auxtemp=”20” auxvol=”1” open_or_close=”0”/>
            <inquire dev="22-3-2-7-13" cycle_id= "1" step_id="1" step_type="cccv" workstatus=”stop” barcode=”” current="1" voltage="2" capacity="100"
                energy="10" totaltime=”3090909” relativetime=”7230910” auxtemp=”20” auxvol=”1” open_or_close=”0”>
                <DBC message_name="BMS_Frame08" signal_name="Local_xCtrCON3" signal_remark="" value="8" unit="" />
                <DBC message_name="BMS_Frame07" signal_name="Local_TotalCap" signal_remark="" value="0.09" unit="AH" />
                <DBC message_name="BMS_Frame07" signal_name="Local_SOHCap" signal_remark="" value="0.1" unit="AH" />
                <DBC message_name="BMS_Frame07" signal_name="Local_DesignCap" signal_remark="" value="0.11" unit="AH" />
              </inquire>
            <inquire dev="22-3-2-8-15" cycle_id= "1" step_id="1" step_type="cccv" workstatus=”stop” barcode=”” current="1" voltage="2" capacity="100"
                energy="10" totaltime=”3090909” relativetime=”7230910” auxtemp=”20” auxvol=”1” open_or_close=”0””>
                <DBC message_name="BMS_Frame08" signal_name="Local_xCtrCON3" signal_remark="" value="8" unit="" />
                <DBC message_name="BMS_Frame07" signal_name="Local_TotalCap" signal_remark="" value="0.09" unit="AH" />
                <DBC message_name="BMS_Frame07" signal_name="Local_SOHCap" signal_remark="" value="0.1" unit="AH" />
                <DBC message_name="BMS_Frame07" signal_name="Local_DesignCap" signal_remark="" value="0.11" unit="AH" />
              </inquire>

        </list>
</bts>
\n\n
```

instruction:

tag	function	instruction
bts version	Protocol version	1.0 version now
cmd	Command Identifier	inquire_resp:inquire real-time data respond
list	Channels list	count:Numbers of inquire information
inquire	Channel information	dev:device step_id:step ID step_type:工step typr workstatus:work status current:current(unit “A”) voltage:voltage(unit “V”) capacity:capacity(unit “Ah”) energy:energy(unit “Wh”)

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		totaltime:total time(unit “s”) relativetime:relative time(unit “s”) auxtemp:auxiliary temperature(unit “°C”) auxvol:auxiliary voltage(unit “V”) open_or_close:the status of channel(0 mean closed，1 means open)
DBC	DBC parameter	message_name: message name signal_name: signal name signal_remark: remark value: value unit: unit

1.1.9 stop broadcast information(broadcaststop)

```
<?xml version="1.0" encoding="UTF-8" ?>
<bts version="1.0">
        <cmd>broadcaststop</cmd>
        <list count = "1">
            <stop ip="127.0.0.1" devtype="22" devid="3">true</stop>
        </list>
</bts>
\n\n
```

instruction:

tag	function	instruction
bts version	Protocol version	1.0 version now
cmd	Command Identifier	broadcaststop: Stop broadcast command. Only send to one device. Can not send to multi device
list	Device list	count:Number of channel, it will shows “1”
stop	Device information	ip:server IP devtype:device type devid:device ID true: send false:not send

stop broadcast information respond(broadcaststop_resp)

```
<?xml version="1.0" encoding="UTF-8" ?>
<bts version="1.0">
        <cmd>broadcaststop_resp</cmd>
        <list count = "1">
         <stop ip="127.0.0.1" devtype="22" devid="3">ok</stop>
        </list>
</bts>
\n\n
```

instruction:

tag	function	instruction
bts version	Protocol version	1.0 version now
cmd	Command Identifier	inquire_resp:inquire real-time data respond
list	Device list	count:Numbers of inquire information
stop	Device information	ip:server IP devtype:device type

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		devid:device ID ok:send successful false:send failed

1.1.10Continue(continue/resume)

```
<?xml version="1.0" encoding="UTF-8" ?>
<bts version="1.0">
        <cmd>continue</cmd>
        <list count = "2">
            <continue ip="127.0.0.3" devtype="22" devid="3" subdevid="2" chlid="1" >true</continue>
            <continue ip="127.0.0.3" devtype="22" devid="3" subdevid="2" chlid="2" >true</continue>
        </list>
</bts>
\n\n
```

instruction:

tag	function	instruction
bts version	Protocol version	1.0 version now
cmd	Command Identifier	continue: Continue command
list	Start list of channel	count:number of continue channel
continue	Continue channel	ip:server IP devtype:device type devid:device ID subdevid:unit ID chlid:channel ID content: true means continue False means not to continue

Continue respond (continue_resp)

```
<?xml version="1.0" encoding="UTF-8" ?>
<bts version="1.0">
        <cmd>continue_resp</cmd>
        <list count = "2">
                <continue ip="127.0.0.1" devtype="22" devid="3" subdevid="2" chlid="8">ok</continue>
                <continue ip="127.0.0.1" devtype="22" devid="3" subdevid="1" chlid="6">ok</continue>
        </list>
</bts>
\n\n
```

instruction:

tag	function	instruction
bts version	Protocol version	1.0 version now
cmd	Command Identifier	continue_resp:continue respond command
list	Channel list	count:number of continue channel
continue	Continue channel respond information	ip:server IP devtype:device type devid:device ID subdevid:unit ID

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		chlid:channel ID ok:continue successful false:continue failed

1.1.11 channel control(chl_ctrl)

```
<?xml version="1.0" encoding="UTF-8" ?>
<bts version="1.0">
<cmd>chl_ctrl</cmd>
        <list count = "1">
                <chl_ctrl ip="127.0.0.3" devtype="22" devid="3" subdevid="2" chlid="1" >0</chl_ctrl>
        </list>
</bts>
\n\n
```

instruction:

tag	function	instruction
bts version	Protocol version	1.0 version now
cmd	Command Identifier	chl_ctrl: channel control command
list	Channel list	count: number of control channel
chl_ctrl	Channel controlled	ip:server IP devtype:device type devid:device ID subdevid:unit ID chlid:channel ID Content: 0 means closed, 1 means open

Channel control respond(chl_ctrl_resp)

```
<?xml version="1.0" encoding="UTF-8" ?>
<bts version="1.0">
        <cmd>chl_ctrl_resp</cmd>
        <list count = "1">
                <chl_ctrl ip="127.0.0.3" devtype="22" devid="3" subdevid="2" chlid="1" >ok</chl_ctrl>
        </list>
</bts>
\n\n
```

instruction:

tag	function	instruction
bts version	Protocol version	1.0 version now
cmd	Command Identifier	chl_ctrl_resp:Channel control respond command
list	Channel list	count:number of control channel
chl_ctrl	Control channel respond information	ip:server IP devtype:device type devid:device ID subdevid:unit ID chlid:channel ID ok:mean successful false:means failed

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1.1.12 Jump(Goto)

```
<?xml version="1.0" encoding="UTF-8" ?>
<bts version="1.0">
        <cmd>goto</cmd>
        <list count = "2">
            <goto ip="127.0.0.3" devtype="22" devid="3" subdevid="2" chlid="1"  step=”3”>true</goto>
            <goto ip="127.0.0.3" devtype="22" devid="3" subdevid="2" chlid="2" step=”4”>true</goto>
        </list>
</bts>
\n\n
```

instruction:

tag	function	instruction
bts version	Protocol version	1.0 version now
cmd	Command Identifier	goto: Jump command
list	Starting number of channel	count: number of jump channel
goto	Jump channel	ip:server IP devtype:device type devid:device ID subdevid:unit ID chlid:channel ID step:jump to assigned channel content: true means jump False means not to jump

Jump respond(goto_resp)

```
<?xml version="1.0" encoding="UTF-8" ?>
<bts version="1.0">
        <cmd>goto_resp</cmd>
        <list count = "2">
                <goto ip="127.0.0.1" devtype="22" devid="3" subdevid="2" chlid="8" step=”3” >ok</goto>
                <goto ip="127.0.0.1" devtype="22" devid="3" subdevid="1" chlid="6" step=”3” >ok</goto>
        </list>
</bts>
\n\n
```

instruction:

tag	function	instruction
bts version	Protocol version	1.0 version now
cmd	Command Identifier	goto_resp:junp respond command
list	Channel list	count:number of jump channel
goto	Jump channel respond information	ip:server IP devtype:device type devid:device ID subdevid:unit ID chlid:channel ID ok: jump successful false: jump failed

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1.1.13 Inquire DF data(inquiredf)

```
<?xml version="1.0" encoding="UTF-8" ?>
<bts version="1.0">
        <cmd>inquiredf</cmd>
        <list count = "2">
            <chl devtype="24" devid="1" subdevid="1" chlid="1" testid=”0”/>
            <chl devtype="24" devid="1" subdevid="1" chlid="2" testid=”0”/>
        </list>
</bts>
\n\n
```

instruction:

tag	function	instruction
bts version	Protocol version	1.0 version now
cmd	Command Identifier	inquireddf: inquire DF data command
list	Channel list	count:channel numbers
chl	Single channel information	Only support inquired under 127.0.1.0 server devtype:device type devid:device ID subdevid:unit ID chlid:channel ID testid:test ID，0 means current test

inquire DF data respond(inquiredf_resp)

```
<?xml version="1.0" encoding="UTF-8" ?>
<bts version="1.0">
        <cmd>inquiredf_resp</cmd>
        <list count = "2">
                <chl devtype="22" devid="3" subdevid="2" chlid="8" testid=”11” count=”10”>true</chl>
                <chl devtype="22" devid="3" subdevid="1" chlid="6" testid=”10” count=”11”>false</chl>
        </list>
</bts>
\n\n
```

instruction:

tag	function	instruction
bts version	Protocol version	1.0 version now
cmd	Command Identifier	inquiredf_resp:Stop respond command
list	Channel list	count:channel numbers
chl	Channel information	Only support inquired under 127.0.1.0 server devtype:device type devid:device ID subdevid:unit ID chlid:channel ID testid:test ID count: The numbers of DF data that mid-machine upload true: All DF data has been uploaded

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		false: This test DF data hasn't uploaded completely

1.1.14 Download step layer data(downloadStepLayer)

```
<?xml version="1.0" encoding="UTF-8" ?>
<bts version="1.0">
 <cmd>downloadStepLayer</cmd>
 <downloadStepLayer  devtype="24" devid="1" subdevid="2" chlid="1" testid="0" dcir="1" />
 <V1I1 previousstep = "1" type="1" value="" />
 <V2I2 previousstep = "0" type="0" value="" />
</bts>
\n\n
```

instruction:

tag	function	instruction
bts version	Protocol version	1.0 version now
cmd	Command Identifier	downloadStepLayer: download step layer data
download	Can only download one channel data each time	Only support inquired under 127.0.1.0 server devtype:device type devid:device ID subdevid:unit ID chlid:channel ID testid:test ID dcir:get DCIR values or not, 0-no, 1-yes
V1I1	VI&I1	previousstep:Use values of last step type:How to get the value, 0-the 1st record, 1-the last record, 2-The no.#N record, 3- the no.# ms record, 4-%N of the set value value:N Default: Last record of previous step
V2I2	V2&I2	Same as V1I1 Default: First record of current step

Download step layer data response(downloadStepLayer_resp)

```
<?xml version="1.0" encoding="UTF-8"?>
<bts version="1.0">
  <cmd>downloadStepLayer_resp</cmd>
  <downloadStepLayer devtype="24" devid="1" subdevid="2" chlid="1" testid="2818580404" />
  <list count="4">
    <data startseqid="1" endseqid="61" stepindex="1" stepid="1" cycleid="1" steptype="rest" steptime="60000" endatime="2020-03-20 14:43:30" startvolt="2.5" endvolt="2.5" startcurr="0" endcurr="0" cap="0" eng="0" dcir="0" >
      <DBC message_name="BMS_Frame05" signal_name="Local_DisCHGMaxCurPermit" signal_remark="" value="1" unit="A" />
      <DBC message_name="BMS_Frame05" signal_name="Local_RecentDischg_Cap" signal_remark="" value="2" unit="Ah" />
    </data>
    <data startseqid="62" endseqid="662" stepindex="2" stepid="2" cycleid="1" steptype="cc" steptime="600000" endatime="2020-03-20 14:43:36" startvolt="2.501" endvolt="3.101" startcurr="1" endcurr="1" cap="0.166666666666667" eng="0.833333333333333" dcir="100">
      <DBC message_name="BMS_Frame05" signal_name="Local_DisCHGMaxCurPermit" signal_remark="" value="1" unit="A" />
      <DBC message_name="BMS_Frame05" signal_name="Local_RecentDischg_Cap" signal_remark="" value="2" unit="Ah" />
    </data>
    <data startseqid="663" endseqid="723" stepindex="3" stepid="1" cycleid="2" steptype="rest" steptime="60000" endatime="2020-03-20 14:43:37" startvolt="3.101" endvolt="3.101" startcurr="0" endcurr="0" cap="0" eng="0" dcir="0">
      <DBC message_name="BMS_Frame05" signal_name="Local_DisCHGMaxCurPermit" signal_remark="" value="1" unit="A" />
      <DBC message_name="BMS_Frame05" signal_name="Local_RecentDischg_Cap" signal_remark="" value="2" unit="Ah" />
    </data>
```


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```
    <data startseqid="724" endseqid="1324" stepindex="4" stepid="2" cycleid="2" steptype="cc" steptime="600000"
endatime="2020-03-20 14:43:43" startvolt="3.102" endvolt="3.702" startcurr="1" endcurr="1" cap="0.166666666666667"
eng="0.833333333333333" dcir="100">
      <DBC message_name="BMS_Frame05" signal_name="Local_DisCHGMaxCurPermit" signal_remark="" value="1" unit="A" />
      <DBC message_name="BMS_Frame05" signal_name="Local_RecentDischg_Cap" signal_remark="" value="2" unit="Ah" />
    </data>
  </list>
</bts>
\n\n
```

instruction：

tag	function	instruction
bts version	Protocol version	1.0 version now
cmd	Command Identifier	downloadStepLayer_resp:Download step layer data response
downloadStepLayer	Channel info	devtype:Device type devid:Device ID subdevid:Unit ID chlid:Channel ID testid:Test ID
list	Data quantity	
data	Step layer data info	startseqid:Step start ID endseqid:Step end ID stepindex:Step sequence stepid:Step original ID cycleid:Cycle ID steptype:Step type Steptime: Step working time(ms) Endatime: Step end time startvolt: Step start votlage(V) endvolt: Step end voltage(V) startcurr: Step start current(A) endcurr: Step end current(A) cap: Capacity (Ah) Eng: Energy(Wh) dicr: DCIR value(mΩ)
DBC	DBC parameter	message_name: message name signal_name: signal name signal_remark: remarks Value: value Unit: Unit

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