iZone Ethernet Interface

V1.00

32 Bannick Court
Canning Vale WA 6155

www.air-stream.com.au

phone 6254 2408
fax 6254 2486

email info@air-stream.com.au
abn 95 146 196 778

Revision History

Version	Date	Description	Author
1.0	27/05/2014	Initial draft	Witold Milarski

Table of Contents

1 Introduction

1.1 Purpose

This document describes iZone's Ethernet network communication protocol, to allow 3rd parties to develop interfaces to control iZone user control functions.

1.2 Scope

Describes Ethernet network data exchange between a controlling device and iZone system.

1.3 Acronyms, Abbreviations, Terms and Definitions

LAN	Local Area Network
PHY	Physical Layer
CB	Controls-Bridge
CTS	Controls-Touch Screen

2 Introduction

The iZone system comes with an optional module called Bridge (CB), which can be connected to a LAN and used to interface to the iZone system user functions. The CB's LAN hardware interface is based on 10BASE-T/100BASE-TX PHY.

To communicate with the device both UDP and TCP/IP protocols are used and JSON is used for data formatting as described in the following section.

All urls, strings and commands are case sensitive.

2.1 CB Configuration.

iZone's CTS can be used to configure view the status of the CB. The CB can be set with a static or dynamic IP address. Its MAC address and IP address can also be checked. For details please view the iZone User Manual.

2.2 CB Network Discovery.

To "discover" CB on the network the following is exchanged over UDP:

The controller sends: "IASD" to 255.255.255.255:12107

CB responds: "ASPort_PortNo,CB_ID,CB_IP"

Where:
PortNo – is the port number CB listens on
CB_ID – is the CB ID number. This number is set is factory and is unique to each CB (or in fact iZone system)
CB_IP – is the IP address allocated to the CB.

The use of unique CB_ID number allows for connection of multiple iZone system to the same LAN.

2.3 Controller-CB data exchange.

The following sections describe the JSON strings sent between the controlling device and CB

2.3.1 System Configuration information.

This information is located at:
CB_IP/SystemSettings

Where CB_IP is the IP address of CB.

The following is the response from CB:

```
{
        "AirStreamDeviceUId":  "CB_ID",
        "DeviceType":   "ASH",
        "SysOn":        "on",
        "SysMode":      "cool",
        "SysFan":       "auto",
        "SleepTimer":   0,
        "UnitType":     "Mitsubishi Electric",
```

```
        "Supply":       "21.9",
        "Setpoint":     "21.0",
        "Temp": "21.9",
        "RAS":  "master",
        "CtrlZone":     13,
        "Tag1": "iZone Control Systems",
        "Tag2": "",
        "Warnings":     "none",
        "ACError":      " OK",
        "Id":   0,
        "EcoLock":      "true",
        "EcoMax":       "30.0",
        "EcoMin":       "15.0",
        "NoOfConst":    1,
        "NoOfZones":    8,
        "SysType":      "310",
        "AirflowLock":  "on",
        "UnitLocked":   "false",
        "FreeAir":      "disabled",
        "FanAuto":      "3-speed"
}
```


2.3.2 System Configuration JSON field description:

"AirStreamDeviceUId"
This is the unique CB identifier number (9 digit).

"DeviceType"
This is the device type this information is sent from. For the case of CB it will always be **"ASH"**.

"SysOn"
This indicates whether the iZone system is on or off. Possible values are:
"on" – iZone is running
"off" – iZone is not running

"SysMode"
This indicates the mode the AC unit is running in. Possible values are:
"cool" – AC unit is in cooling mode
"heat" – AC unit is in heating mode
"vent" – AC unit is in vent mode
"dry" – AC unit is in dry mode
"auto" – AC unit is in auto mode

"SysFan"
This indicates the speed setting of the fan. Possible values are:
"low" – the fan is set to low speed,
"med" – the fan is set to medium speed,
"high" – the fan is set to high speed
"auto" – the fan is set to auto mode.
For information on which fan speeds are allowed please refer to "FanAuto" field.

"SleepTimer"
This indicates the setting of the sleep timer function. Currently the following values are possible:

"0" – sleep timer is off
"30" – sleep timer is set for 30 minutes
"60" – sleep timer is set for 60 minutes
"90" – sleep timer is set for 90 minutes
"120" – sleep timer is set for 120 minutes

"UnitType"
This indicates the AC unit make the iZone system is connected to. The possible values are:
"none" – iZone is not connected to an AC unit
"Daikin" – iZone is connected to a Daikin AC unit
"Panasonic" – iZone is connected to a Panasonic AC unit
"Mitsubishi Electric" – iZone is connected to a Mitsubishi Electric AC unit
"LG301" – iZone is connected to a LG AC unit. This unit only allows for on/off control. Other functions such as mode and fan speed are not controlled.
"LG310" – iZone is connected to a LG AC unit. This unit allows for control of all functions.
"Fujitsu" – iZone is connected to a Fujitsu AC unit
"Samsung" – iZone is connected to a Samsung AC unit
"Temperzone" – iZone is connected to a Temperzone AC unit

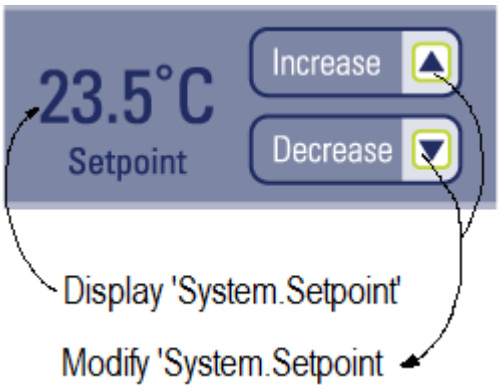
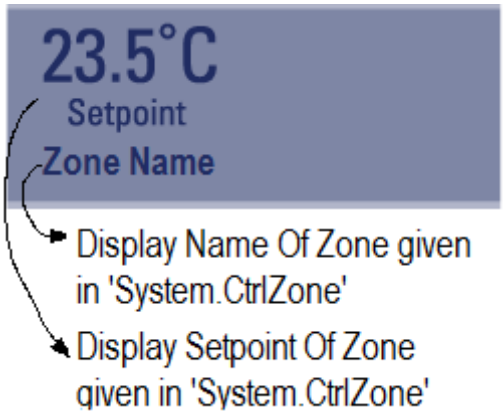
"Supply"
This indicates the current supply, or in duct, air temperature.

"Setpoint"
This indicates the AC unit setpoint temperature

"Temp"
This indicates the return, or room, air temperature

"RAS"
This indicates the current selection of the Return Air temperature Sensor. Possible values are:
"master" – the AC unit is controlled from a CTS, which is manually selected
"RAS" – the AC unit is controller from its own return air sensor
"zones" – the AC unit is controlled from a CTS, which is automatically selected dependant on the cooling/ heating need of zones.

Based on this setting the AC unit screen displays different information as described in table below.

<table>
<tr><th colspan="4">This is for the unit setpoint section of the "AC Unit Control" screen</th></tr>
<tr><th>JSON field "RAS"</th><th>JSON field "CtrlZone"</th><th>To be displayed on AC unit control screen</th><th>info In JSON @:</th></tr>
<tr><td>RAS</td><td>N/A</td><td rowspan="2"> 
</td><td rowspan="2">"Setpoint"</td></tr>
<tr><td>master</td><td>13</td></tr>
<tr><td>master</td><td>1-12</td><td rowspan="2"> 
</td><td rowspan="2">"zones["CtrlZone"].Setpoint"
"zones["CtrlZone"].Name"</td></tr>
<tr><td>zones</td><td>1-12</td></tr>
</table>

"CtrlZone"
This indicates the zone that currently controls the AC unit. This together with the "RAS" field control what is displayed on the AC unit screen.

"Tag1"
This is the user configured text which displays on the CTS

"Tag2"
This is the user configured text which displays on the CTS

"Warnings"
This indicates the current system warning. Currently possible values are:
"none" – there are no current warnings
"filter" – filter service required warning

"ACError"
This indicates the currently active AC unit fault. This is a 3 character string. If this filed reports **" OK"**, then there are no faults present.

"Id"
This is not used.

"EcoLock"
This indicates whether the economy function lock is on or off. Possible values are:
"true" – the economy lock function is active. This limits the zone and system temperature setpoints to **"EcoMax"** and **"EcoMin"**
"false" – the economy lock function is not active.

"EcoMax"
This indicates the maximum value a setpoint can be set to.

"EcoMin"
This indicates the minimum value a setpoint can be set to.

"NoOfConst"
This indicates the number of constant zones the system is configured for.

"NoOfZones"
This indicates the number of zone the system is configured for.

"SysType"
This indicates the type of the iZone system connected. Possible values are:
"110" – the system is zone control only and all the zones are OPEN/CLOSE zones
"210" - the system is zone control only. Zones can be temperature controlled, dependant on the zone settings.
"310" – the system is zone control and unit control.

"AirflowLock"
This indicates whether the airflow adjustment is allowed. Possible values are:
"on" – both min and max settings adjustment is not allowed
"onMin" – only nim setting adjustment is not allowed
"off" – both nim and max setting adjustment is allowed.

"UnitLocked"
This indicates whether the system is locked. Possible values are:
"true" – the system is locked, it is not possible to change any of the system settings or parameters.
"false" – the system is unlocked, all functions are accessible to the user.

"FreeAir"
This indicates the setting of the Free Air system. Possible values are:
"disabled" – Free Air is disabled (free air button is not shown on the CTS)
"off" – free air system is turned off
"on" – free air system is turned on

"FanAuto"
This indicates the setting of the Fan Auto functions. Possible values are:
"disabled" – Fan Auto function is disabled. Fan speeds allowed on the AC unit control screen are – low, med, high
"3-speed" - Fan Auto function is enabled. Fan speeds allowed on the AC unit control screen are – low, med, high and auto
"2-speed" - Fan Auto function is enabled. Fan speeds allowed on the AC unit control screen are – low, high and auto

"var-speed" - Fan Auto function is enabled. Fan speeds allowed on the AC unit control screen are – low, med, high and auto

2.3.3 Zone configuration and status information.

This information is located at:
CB_IP/Zones1_4, CB_IP/Zones5_8 and CB_IP/Zones9_12 for zones 1 to 4, 5 to 8 and 9 to 12 respectively.

The following is the information for zones 1 to 4 from CB


```
[{
                "AirStreamDeviceUId":  "CB_ID",
                "Id":   0,
                "Index":        0,
                "Name": "Zone 1",
                "Type": "auto",
                "Mode": "close",
                "SetPoint":     22.500000,
                "Temp": 24,
                "MaxAir":       75,
                "MinAir":       0,
                "Const":        255,
                "ConstA":       "false"
        }, {
                "AirStreamDeviceUId":  "CB_ID",
                "Id":   0,
                "Index":        1,
                "Name": "Zone 22",
                "Type": "auto",
                "Mode": "close",
                "SetPoint":     23,
                "Temp": 24.889999,
                "MaxAir":       100,
                "MinAir":       0,
                "Const":        255,
                "ConstA":       "false"
        }, {
                "AirStreamDeviceUId":  "CB_ID",
                "Id":   0,
                "Index":        2,
                "Name": "Zone 33",
                "Type": "auto",
                "Mode": "auto",
                "SetPoint":     23,
                "Temp": 24.129999,
                "MaxAir":       100,
                "MinAir":       0,
                "Const":        255,
                "ConstA":       "false"
        }, {
                "AirStreamDeviceUId":  "CB_ID",
                "Id":   0,
                "Index":        3,
                "Name": "Zone 4",
                "Type": "auto",
                "Mode": "auto",
                "SetPoint":     23,
                "Temp": 24.049999,
                "MaxAir":       100,
                "MinAir":       0,
```

```
            "Const":        255,
            "ConstA":       "false"
    }]
```

2.3.4 Zone configuration and status JSON field description:

"AirStreamDeviceUId"
This is the unique CB identifier number (9 digit).

"Id"
This is not used.

"Index"
This is the zone index number. This number will be between 1 and 12.

"Name"
This is the zone name.

"Type"
This indicates the type of the zone. Possible values are:
"auto" – the zone has temperature control enabled
"opcl" – the zone is open/close only
"const" – the zone is a constant zone

"Mode"
This indicates the current mode the zone is in. Possible values are:
"open" – the zone is currently open
"close" – the zone is currently closed
"auto" – the zone is currently in temperature control mode

"SetPoint"
This is the current zone setpoint used in temperature control mode. The setpoint can be set between 15 and 30 degC if **"EcoLock" = "false"** or **"EcoMin"** and **"EcoMax"** if **"EcoLock" = "true"**.

"Temp"
This is the current temperature in the zone.

"MaxAir"
This is the setting for maximum zone damper position.

"MinAir
This is the setting for minimum zone damper position.

"Const"
This indicates whether the zone is a constant. If the value is 255 the zone is not a constant. Otherwise the number indicates the number of a constant.

"ConstA"
This indicates whether the constant zone is active. Possible values are:
"false" – constant is currently inactive
"true" – constant is currently active

2.3.5 Schedules configuration and status information.

This information is located at:
CB_IP/Schedules1_5 and CB_IP/Schedules6_9 for schedules 1 to 5 and 6 to 9 respectively.

The following is the information for schedules 6 to 9 from CB:


```
[{
                "AirStreamDeviceUId":  "CB_ID",
                "Id":   0,
                "Index":        5,
                "Name": "Favourite 6",
                "Active":       "false",
                "Execute":      "false",
                "Exists":       "false"
        }, {
                "AirStreamDeviceUId":  "CB_ID",
                "Id":   0,
                "Index":        6,
                "Name": "Favourite 7",
                "Active":       "false",
                "Execute":      "false",
                "Exists":       "false"
        }, {
                "AirStreamDeviceUId":  "CB_ID",
                "Id":   0,
                "Index":        7,
                "Name": "Favourite 8",
                "Active":       "false",
                "Execute":      "false",
                "Exists":       "false"
        }, {
                "AirStreamDeviceUId":  "CB_ID",
                "Id":   0,
                "Index":        8,
                "Name": "Favourite 9",
                "Active":       "false",
                "Execute":      "false",
                "Exists":       "false"
        }]
```


2.3.6 Schedule configuration and status JSON field description:

"AirStreamDeviceUId"
This is the unique CB identifier number (9 digit).

"Id"
This is not used.

"Index"
This is the schedule index number. This number is between 1 and 9.

"Name"
This is the schedule name.

"Active"
This indicates whether the schedule is enabled. Possible values are:
"false" – schedule is not active

"true" – schedule is active

"Execute"
This indicates whether the schedule needs to execute (not used in this configuration). Possible values are:
"false" – schedule does not need to be executed
"true" – schedule needs to be executed

"Exists"
This indicates whether the schedule exists. If the schedule does not exist it cannot be activated. Possible values are:
"false" – schedule does not exist (not configured)
"true" – schedule exists and can be enabled.

2.3.7 iZone commands

The below are the commands that CB supports. These commands can be used to change setting in the iZone system. The data sent is formatted with JSON and is sent using POST requests.

2.3.7.1 Turn system On/Off

To turn the system on or off, send:

```
{
        "SystemON":"x"
}
```

Where x is:
"on" - to turn system on
"off" - to turn system off

to:

CB_IP/SystemON

2.3.7.2 Change AC unit mode

To change AC unit mode, send:

```
{
      "SystemMODE":"x"
}
```

Where x is:
"cool" - to set unit to cool mode
"heat" - to set unit to heat mode
"vent" - to set unit to vent mode
"dry" - to set unit to dry mode
"auto" - to set unit to auto mode

To:
CB_IP/SystemMODE

2.3.7.3 Change fan speed

To change the fan speed, send:

```
{
```

```
        "SystemFAN":"x"
}
```

Where x is:
"low" - to set the fan to low speed
"medium" - to set the fan to medium speed
"high" - to set the fan to high speed
"auto" - to set the fan to auto speed

To
CB_IP/SystemFAN

2.3.7.4 Change AC unit setpoint

To change the AC unit setpoint, send:

```
{
        "UnitSetpoint":"23.5"
}
```

To:
CB_IP/UnitSetpoint

2.3.7.5 Change zone setting

To change a zone setting, send:

```
{
        "ZoneCommand":{
                "ZoneNo":"x",
                "Command":"y"
        }
}
```

Where:
x - is zone number (1 to 12)
y - is:
"open" - to open the zone
"close" - to close the zone
or a number (zone setpoint)

To
CB_IP/ZoneCommand

2.3.7.6 Change zone minimum airflow setting

To change zone minimum airflow setting, send:

```
{
        "AirMinCommand":{
                "ZoneNo":"x",
                "Command":"y"
        }
}
```

Where:
x - is zone number (1 to 12)
y - is a number (airflow Min Setting) between 0 and 100%
This setting is adjusted in 5%.
This setting must be less than the zone's MaxAir setting

To:
CB_IP/AirMinCommand

2.3.7.7 Change zone maximum airflow setting

To change zone maximum airflow setting, send:

```
{
	"AirMaxCommand":{
		"ZoneNo":"x",
		"Command":"y"
	}
}
```

Where:
x - is zone number (1 to 12)
y - is a number (airflow Min Setting) between 0 and 100%
This setting is adjusted in 5%.
This setting must be larger than the zone's MinAir setting

To:
CB_IP/AirMaxCommand

2.3.7.8 Execute a favourite

To execute a favourite, send:

```
{
	"FavouriteSet":"x"
}
```

Where x is the favourite number (1 to 9)

To:
CB_IP/FavouriteSet

2.3.7.9 Activate/deactivate schedule

To activate or deactivate a schedule, send:

```
{
	"ScheduleCommand":{
		"SchedNo":"x",
		"Command":"y"
	}
}
```

Where:
x - is the schedule number (1 to 9)
y - is:
`"on"` - to enable the schedule
`"off"` - to disable the schedule

To:
CB_IP/ScheduleCommand

2.3.7.10 Change sleep timer

To change sleep timer setting, send:

```
{
      "SleepTimer": 0
}
```

Where x is:
number of minutes to set the timer for (0 to turn it off)

To:
CB_IP/SleepTimer

2.3.7.11 Turn FreeAir on and off

To turn the FreeAir on or off, send:

```
{
      "FreeAir":"x"
}
```

Where x is:
`"on"` - to turn FreeAir on
`"off"` - to turn FreeAir off

To:
CB_IP/FreeAir

2.3.7.12 Request status information.

Status information can also be requested using the commands interface. This has the same effect as procedures described in sections 2.3.1 through to 2.3.6.

To request configuration and status information, seng:

```
{
      "StatusRequest":"x"
}
```

Where x is:
`"System"` - to request system status
`"Zones1_4"` - to request zones 1 to 4 status
`"Zones5_8"` - to request zones 5 to 8 status
`"Zones9_12"` - to request zones 9 to 12 status
`"Schedules1_5"` - to request schedules 1 to 5 status.
`"Schedules6_9"` - to request schedules 6 to 9 status.

2.3.8 System configuration or status change notification.

To ensure that the 3rd party controller has the latest information from the iZone system, it can constantly poll the CB. Alternatively, CB broadcasts a system change notification on UDP. The controller can listen for these notifications and only send data request upon receiving the notification. Also, regardless of whether there has or has not been a change the notifications are sent periodically every 120s.

The notifications are sent to the broadcast address `255.255.255.255` on port `7005`.

The notification says:
"iZoneChanged_System" – if a system parameter has changed
"iZoneChanged_Zones" – if a zone parameter has changed
"iZoneChanged_Schedules" – if a schedule parameter has changed.

3 References