# Unitary IP/MSTP/T1L Controller

May 12, 2023

## Updated Firmware only Release Bulletin

## 1. Release Summary

| | |
|---|---|
| **Product Name** | Unitary IP/MSTP/T1L Controllers |
| **Type of Release** | Updated Firmware only Release |
| **Release Date** | May 12, 2023 |

### 1.1. Scope of Release

The release is intended as an updated release for the product Unitary controllers 24V of variant type MSTP, IP and T1L. The release includes updated Firmware release only.

**Contact Details**

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### 1.2. Part Numbers

| PART NUMBER | HOUSING | UNIVERSAL IO | SOLID STATE RELAY (SSR) | RELAY | COMMUNICATION | SYLK™ BUS | BLUETOOTH |
|---|---|---|---|---|---|---|---|
| UN-RS0844ES24NMC | Small | 8 | 4 | 4 | BACnet™ IP | Yes | No |
| UN-RS0844ESB24NMC | Small | 8 | 4 | 4 | BACnet™ IP | Yes | Yes |
| UN-RS0844MS24NMC | Small | 8 | 4 | 4 | BACnet™ MS/TP | Yes | No |
| UN-RS0844MSB24NMC | Small | 8 | 4 | 4 | BACnet™ MS/TP | Yes | Yes |
| UN-RS0844TS24NMC | Small | 8 | 4 | 4 | BACnet™ T1L | Yes | No |
| UN-RS0844TSB24NMC | Small | 8 | 4 | 4 | BACnet™ T1L | Yes | Yes |
| UN-RL1644ES24NMC | Large | 16 | 4 | 4 | BACnet™ IP | Yes | No |
| UN-RL1644ESB24NMC | Large | 16 | 4 | 4 | BACnet™ IP | Yes | Yes |
| UN-RL1644MS24NMC | Large | 16 | 4 | 4 | BACnet™ MS/TP | Yes | No |
| UN-RL1644MSB24NMC | Large | 16 | 4 | 4 | BACnet™ MS/TP | Yes | Yes |
| UN-RL1644TS24NMC | Large | 16 | 4 | 4 | BACnet™ T1L | Yes | No |
| UN-RL1644TSB24NMC | Large | 16 | 4 | 4 | BACnet™ T1L | Yes | Yes |

# 2. Release Components and Versions

The Firmware and Tool packages are available on CentraLine Partner Web on www.centraline.com and SBC support page www.sbc-support.com.

The same tools version can also be used for MERLIN NX and Compact VAV controllers.

## 2.1. Tools and Firmware

| Components | Version | Changed in this Release? |
|---|---|---|
| **Tools version** | 2.5.0.17 | No |
| **Firmware version** | 2.0.3.44 | YES |
| **Firmware File Name (MSTP, IP and T1L)** | NC_Unitary_V2.0.3.44.ufw | YES |
| **Application Template Version** | IRMN_H_0002 1.0.0.9<br>IRMN_H_0002_1.0.0.10 | No |
| **Boot Loader** | 1.9.2.1 | No |
| **IRM Function Block** | IRMN_FB_Ver_2.0.0.0 | No |

### 2.1.1 Modules Details

The Jar files included in the tool are listed as follows:

| Module Name | Version – 4.11.0 | Version – 4.10.3 | Version – 4.10.1 |
|---|---|---|---|
| **honIrmControl-doc.jar** | 4.11.0.2.5.0.17 | 4.10.3.2.5.0.17 | 4.10.1.2.5.0.17 |
| **honIrmControl-ux.jar** | 4.11.0.2.5.0.17 | 4.10.3.2.5.0.17 | 4.10.1.2.5.0.17 |
| **honIrmControl-rt.jar** | 4.11.0.2.5.0.17 | 4.10.3.2.5.0.17 | 4.10.1.2.5.0.17 |
| **honIrmControl-wb.jar** | 4.11.0.2.5.0.17 | 4.10.3.2.5.0.17 | 4.10.1.2.5.0.17 |
| **honIrmConfig-wb.jar** | 4.11.0.2.5.0.17 | 4.10.3.2.5.0.17 | 4.10.1.2.5.0.17 |
| **honIrmConfig-rt.jar** | 4.11.0.2.5.0.17 | 4.10.3.2.5.0.17 | 4.10.1.2.5.0.17 |
| **honIrmConfig-doc.jar** | 4.11.0.2.5.0.17 | 4.10.3.2.5.0.17 | 4.10.1.2.5.0.17 |
| **honirmConfig-ux.jar** | 4.11.0.2.5.0.17 | 4.10.3.2.5.0.17 | 4.10.1.2.5.0.17 |
| **spyderToIrmNxMigrator-wb** | 4.11.0.2.5.0.17 | 4.10.3.2.5.0.17 | 4.10.1.2.5.0.17 |
| **honeywellVersionManager-rt.jar** | 4.11.0.1.1.100 | 4.10.3.1.1.100 | 4.10.1.1.1.100 |
| **honeywellSylkDevice-rt.jar** | 4.11.0.1.2.100 | 4.10.3.1.2.100 | 4.10.1.1.2.100 |
| **honeywellSylkDevice-ux.jar** | 4.11.0.1.2.100 | 4.10.3.1.2.100 | 4.10.1.1.2.100 |
| **docHoneywellSylkDevce-doc.jar** | 4.11.0.1.2.100 | 4.10.3.1.2.100 | 4.10.1.1.2.100 |
| **airFlowBalancer.jar** | 4.11.0.12.2.8 | 4.10.3.12.2.8 | 4.10.1.12.2.11 |
| **honIrmAppl-rt.jar** | 4.11.0.1.0.1.16 | 4.10.3.1.0.1.16 | 4.10.1.1.0.1.16 |

### 2.1.2 Niagara Compatibility

| Niagara Version | Tools Version |
|---|---|
| **Niagara v 4.11.0** | IRM_Tools_V_4.11.0.2.5.0.17 |
| **Niagara v 4.10.3** | IRM_Tools_V_4.10.3.2.5.0.17 |
| **Niagara v 4.10.1** | IRM_Tools_V_4.10.1.2.5.0.17 |

### 2.1.3 Software Compatibility

The latest release of the tool on the higher Niagara version will be forward compatible for the older tools. Users can upgrade their station to a new version of Niagara and use the new version of the tool without loss in data.

| Brands | Versions |
|---|---|
| **CentraLine NX** | 4.10.1.36.137, 4.10.3.20.1.4, 4.11.0.142.4 |
| **EagleHawk NX** | 4.10.1.36.1.2, 4.10.3.20.1.4, 4.11.0.142.2 |
| **Other Niagara Version** | 4.10.1.36, 4.10.3.20, 4.11.0.142 |

## 2.2. Application

The **honIrmAppl** palette includes below applications. After opening the application in the palette, the **IRM Program** Folder can be dragged and dropped onto the controller.

| Application | Version | Description |
|---|---|---|
| **IRMN_H_0002** with TR40, TR42, wired wallmodule | 1.0.0.9 | This application covers the IRMN_H_0002 application. Since it is implemented with subfolders and composites, it is programmed much more clearly and understandably. It also supports Master/Slave and an Optimum Start Recovery Ramp. The application is described in a separate documentation. |
| **IRMN_H_0002** with TR80 | 1.0.0.10 | Same application as above but working with Modbus Wall module TR80 |

After the **Teach Full Application to Controller**, the Service LED will flash yellow, indicating a communication error. The application must be adjusted so that the detection of a communication error should only be activated for the data points that are actually to be received from the plant controller. Search for the following function block types via **IRM Program** - **Find** - **Type** = honIrmControl, then select below function block type (leave **Name** empty) and then set Fail Detect correctly for below datapoints / function block names.

**BacnetBooleanValue**

| Functionblock | FailDetect – Enable |
|---|---|
| Cfg0107_ApplHvacMdBits_Clg02_DX | Set it always to false. This will be corrected. |

**BacnetEnumValue**

| Functionblock | FailDetect – Enable |
|---|---|
| HwWindow | Set it always to false. This will be corrected. |
| All Ext... datapoints | If the data point should be received from the Plant controller, then set FailDetect to true, otherwise to false. |

**BacnetNumericInput**

| Functionblock | EventDetectionEnabled |
|---|---|
| All Hw... datapoints | If the sensor is connected to the hardware terminal, then set it to true, otherwise to false. Datapoints coming from TR40, TR42, TR80 can be set to false, because they are not connected on terminals. Instead, the value is received from a communication bus. |
| EffRmTemp | Set it to true if any room temp is used in the application. |
| EffRmHum | Set it to true if any room humidity is used in the application. |
| EffRmCO2 | Set it to true if any room CO2 is used in the application. |

# 3. Overview of the Release

## 3.1. New Features

- None.

## 3.2. Improvements

- GBCG-42005: Enhance Time Delay Function block to not output NULL.
- GBCG-44089: Factory Out controller once added to database should not change its instance number on reboot if MSTP MAC of IP address is changed.
- GBCG-44221: PID integral internal wind-up limit is revised to (0 - bias) instead of (-100+bias)
- GBCG-44241: Fixed Firmware Crash due to large Modbus Rx Buffer Size
- GBCG-44298: Handled potential FW image corruption (bricked controller) if controller is power cycled after FW upgrade.

## 3.3. Defects Resolved

- GBCG-44187, GBCG-44172: Binary Input, configured with Pulse dry contact, counter value is updating frequently (UIO_1 - UIO_08) only large variant and even there is no physical connection.
- GBCG-44424: FCU24V & VAV controller always getting 24V without any input on BO SSR terminal when we map float control block output
- GBCG-42433: In FCU Controller Sensor point is continuously giving Alarm, even there are No alarms

## 3.4. Known Open Issues

| PCR Number | Defect Details | Workaround |
|---|---|---|
| GBCG-43889 | Clearing Workbench Jobs destroys Workbench Job view hiding additional fields and require view refreshing | Its Niagara Issue, would get updated in the upcoming Niagara versions |
| GBCG-43887 | DHCP seems to ask every minute, even after successful request | Not reproducible in SIT. No impact on device functionality |
| GBCG-43876 | UPM: VoC: If DHCP is not achieved on power on and then it's re-plugged to a network with DHCP the link up does not trigger DHCP request, and we have to wait long time until the request is done. | Controller on bootup having auto ip will always look for DHCP address every minute. This is validated. In rare cases if the issue encountered, please power cycle the controller. |
| BTOOLS-12980 | IO migration is performed although it is not necessary. Unintentional structural changes to the application. | Please follow steps below:<br>1. Set "IO Migration Enabled" flag to false<br>2. Perform the required operation<br>3. Invoke "Migrate Onboard IO" option |
| GBCG-43797 | ModbusWritePoints with In=Null should not be send on Modbus | Should be handled in Application – Application should not write null values to Modbus Write points. |
| GBCG-43796 | Modbus Registers those that are configured as **OperationMode = DoNotSend,** shows OutCause=255 - 1-RS485 Modbus LED switches ON indicating error. | This is only applicable to Modbus registered configured as OperationMode = DoNotSend (refer the details section of the JIRA issue).<br><br>For such Modbus registers which are not used in application, please delete them from application as a workaround for now. |
| GBCG-41734 | Current Behaviour : Service LED shows Sensor failure for UIO Terminals not visible on Onboard IO wire sheet | IO wire sheet with the all the support IO FBs in it don't have this issue.<br>Reset the controller from "Action -> Reset Controller" |
| BTOOLS-14253 | OnBoard IO Migration not working | Do manual migration after adding IRMprogram to device |
| BTOOLS-13439 | Niagara requests for other Properties which are not supported by unitary FCU Controller which adds more traffic to the network. | Niagara behavior, not impact on functionalities |

| | | |
|---|---|---|
| BTOOLS-13186 | PCT: T1L: There is exception error says "Transport queue Overflow" with 100NOs Daisy Chain connection. | BACnet™ related settings recommended by Tridium are captured in SRB/user guide |
| BTOOLS-13145 | PCT MSTP FCU: Device discovery takes up to 15-20 minutes for 64 Controllers. | This is observed occasionally in Supervisor |
| BTOOLS-13128 | T1L & MSTP: PCT: The Niagara Tool shows No device found during discovery. | Re-Initiate device discovery |
| BTOOLS-12980 | IO migration is performed although it is not necessary. Unintentional structural changes to the application. | Please follow steps below:<br>1. "IO Migration Enabled" flag to false<br>2. Perform the required operation<br>3. Invoke "Migrate Onboard IO" option |

# 4. Compatibility

| Item | Description |
|---|---|
| **Hardware** | **MSTP / IP / T1L Unitary Controller 24V** (Refer table in Section 1.2 for different part numbers) |
| **Bacnet Compatibility** | **BACnet profiles certification would be available in Q3-2023**<br>The BACnet Compatibility of this product is described in detail in the PICS, and BTL certification listing for B-AAC for IP, MSTP and T1L variants is expected by Q3-2023. |
| **Language Support** | • **Tools:** English |
| **Translation Web Ui** | Translations need to be handled though lexicons in Niagara |
| **Engineering Access** | Refer to the Securty guide to secure your Niagara installations |

**Supported devices**

| Device | Model |
|---|---|
| **Sylk™ Wall Modules** | TR40, TR40-H, TR40-CO2, TR40-H-CO2, TR42, TR42-H, TR42-CO2, TR42-H-CO2, TR50 (emulation mode only), TR71, TR71-H, TR75, TR75-H, TR75-HE, TR120 (TR75-E), and TR120-H (emulation mode only). |
| **Sylk™ Sensor** | C7400S |
| **Sylk™ Actuators** | MS3103, MS3105, MS3110, and MS3120 |
| **Non Sylk™ Actuators** | MS4103, MS4105, MS7403, MS7405, MS7503, MS7505, MS8103, and MS8105 |
| **Hardwired Wall Modules** | T7460 A, B, C, D, E, F and T7770 A, B, C, D, E, F, G |
| **Modbus Devices** | Modbus RTU devices from any manufacturer (including Honeywell Modbus devices, for example DALI64MODPSUF/S, TR50, and TR80) can be used. |

# 5. Applicable Limitations

## 5.1. Maximum Application Memory

Application size is dependent on number of folders included in application and number of function blocks added inside folders.

While making an application, user should ensure following conditions:

- Maximum 100 folders overall
- Maximum 100 function blocks per folder
- Maximum 6000 function blocks
- Sylk device configuration limited by Sylk power usage

Application design can be distributed between 2 default folders: Periodic folder and Event Folder.

**Periodic Folder**

It executes all the components (folders and function blocks) inside this folder periodically every 500ms.

**Event Folder**

The event-based program is executed

- Whenever a Hardware point which is configured as Binary Input changes its state. But only if that Hardware point is used as an input slot to a function block in the event program. You can configure BI and UI as Binary inputs.
- When a time interval of 1000ms has elapsed.

**Default Settings per brand**

| Default MAX MASTER | Default Min MAC | Default Max MAC | Default BAUDRATE |
|---|---|---|---|
| **127** | 1 | 127 | 38400 |

## 5.2. System Recommendation / Limitation

Additional information about the maximum number of data points (read/written) is shown below:

| Function | Maximum number of devices |
|---|---|
| Recommended Maximum number of BACnet T1L & IP devices<br>• Local (45 Proxy points/15 Ref in per device/15 Ref out per Channel) | 100 devices in Daisy chain (Local Station) |
| • Recommended Maximum number of BACnet T1L & IP devices JACE/EAGLEHAWK (15 Proxy points/15 Ref in per device/15 Ref out per Channel) | 100 devices in Daisy chain (Only in swap out mode) - Engineering to be carried out in local station |
| • Recommended Maximum number of BACnet T1L & IP devices Local Station (45 Proxy points/15 Ref in per device/15 Ref out per Channel) | 40 devices in Ring network. |
| • Recommended Maximum number of BACnet T1L & IP devices JACE/EAGLEHAWK (15 Proxy points/15 Ref in per device/15 Ref out per Channel) | 40 devices in Ring network. |
| Recommended Maximum number of BACnet MS/TP devices per channel with station running in supervisor<br>(15 Proxy points/15 Ref in per device/15 Ref out per channel)<br>***We recommend a lower number of BACnet MS/TP devices depending on communication needs (traffic) and performance needs of the application.*** | 62 devices with BACnet MSTP router (JACE 8000 / EAGLEHAWK) |
| Recommended Maximum number of controllers / JACE 8000 / EAGLEHAWK<br>(15 Proxy points/15 Refin per device/15 Refout per device)<br>***We recommend a lower number of BACnet MS/TP devices depending on communication needs (traffic) and performance needs of the application***. | 40 devices with JACE 8000 / EAGLEHAWK<br>Depending on the performance needs of the application and bus traffic, it is recommended to keep the number of devices below 40. |

| Function Blocks Usage | |
|---|---|
| Maximum recommended function blocks per folder. | 100 |
| Recommended function blocks | 6000 |
| Recommended IRM folders overall | 100 |
| Maximum Wall Module/device (Any Wall module even Sylk) | The maximum number of wall modules depends on the following wall module specific information:<br>• Sylk bus power consumption<br>• Number of parameters used<br>• Total config file size<br>The IRM NX tool has an inbuilt resource calculator to calculate the amount of Sylk wall modules. |

| Modbus Usage | |
|---|---|
| Maximum number of Modbus Registers/IRM | 155 |
| Max no of High Priority Registers per controller. | 6 |

### 5.3. COV Limitations

| Function | Maximum number |
|---|---|
| **COV – client/subscription per controller** | **150** |

# 6. Product Introduction

***Important information:***

The new 24V Unitary controller is being introduced in three backbone communication: IP, MSTP and T1L. Two footprints (small and large) are made available, which differ from each other by the number of Universal IOs featured. Refer the section 1.2 for the part numbers getting introduced.

## 6.1. Recommended Workflow

- **Best workflow**

  Use a MSTP/IP router (e.g. low-cost router from 3rd party) for MSTP controllers

  Run the station on a PC/Supervisor during commissioning.

  Transfer the station to a JACE or Ciper50/EagleHawk once commissioning is done, if there is no supervisory station in the project.

- **Better workflow:**

  Use a MSTP/IP router (e.g. low-cost router from 3rd party) for MSTP controllers

  Run the station on JACE or Ciper50/EagleHawk.

- **Good workflow**
  Connect MSTP controllers to the MSTP interface of the plant controller (JACE, EAGLEHAWK)
  Run the station on JACE or Ciper50/EagleHawk.

## 7. Applicable Literature

All the documents are available either on general Honeywell website or on supporting pages CentraLine Partner web or SBC support website.

| LOB | Product Name | Document Type / Title | Doc ID |
|---|---|---|---|
| **Common Documents** | T1L Media Adapter | Data Sheet | 31-00581 |
| | | Installation Instructions | 31-00582 |
| **Honeywell** | Unitary Controller | Product Datasheet | 31-00613 |
| | | Mounting Instructions | 31-00572 |
| | | Installation Instructions | 31-00614 |
| | | IRM Engineering Guide | EN2B-0414-GE51 |
| | | IRM Function Block User Guide | EN2B-0415-GE51 |

## 8. Release History

| Release Date | Tools Version | Firmware Version | Release Type |
|---|---|---|---|
| **12-Apr-2023** | None | 2.0.3.44 | Firmware release to support CPO release for FCU |
| **28-Apr-2023** | 2.5.0.17 | 2.0.3.33 | Product Launch – General Release |