REDLink - Release Notes

Version: 1.0

Niagara compatible version: 4.2.36.38.1

Scope:

Migrating the driver from Niagara AX to Niagara 4. The release is qualified on N 4.2 release version.

RedLINK Driver

Overview

RedLINK is a proprietary messaging protocol from Honeywell. The Niagara RedLINK driver allows Niagara workbench access to RedLINK thermostats. The RedLINK option card (NPB-2X-REDLINK) is mounted on the WEB Controller (WEB-300E, WEB-600E/U and WEB-700/U) and is connected serially (four wires) to the Wireless Adaptor client, using CAT-3, and thermostat wire.

The Wireless Adaptor client can communicate wirelessly to RedLINK thermostats. The RedLINKNetwork object allows access to all devices through this serially connected Wireless Adaptor. The RedLINKHost object represents a RedLINK host thermostat and contains a set of objects representing the msgClasses (message classes) accessed through that host (thermostat).

The RedLINK driver contains all points in each message class, even if they are unused by an installer. For this reason, commonly used points are listed in the first table. The remaining points are for informational purposes only, and in most cases can be ignored.

RedLINK driver driver is compatible with Niagara WEBs-AX release 3.6 and higher. WEBs branded controllers come with RedLINK driver feature in the license. If you don't see this feature in the license then you have to re-download the license. This feature is available under Honeywell license.

The following thermostats can be accessed with the RedLINK driver.

- Prestige IAQ THX9421R5021 with EIM (THM5421R1013 or THM5421R1021)
- New VisionPro TH8110R, TH8320R, or TH8321R, alone, or with EIM (THM5421R1013 or THM5421R1021).

The RedLINK protocol utilizes messages from two message class sets; Network Management Protocol (NMP) messages provide control of the protocol engine configuration and network management control, and, Residential Network Protocol (RNP) messages pass application data messages between devices.

Hosts

There is always one host in a host group. All other devices in a host group enroll with the host as part of the installation process. The host device does not sleep so battery power is impractical. Every 15 seconds, the host sends synchronization signals along with any application data. When it is not sending, the host is listening.

Clients

Each host application limits the number and types of clients that can enroll. Clients only communicate with their host, not with other clients. Clients may sleep except when they have data to send to the host or to listen for synchronization and application data from the host every 15 seconds.

Message Classes

Message classes are the basis for communicating data within a RedLink system. Each RedLink parameter is predefined to be a member of a specific message class.   Message classes are a structure for encoding a group of related RedLink parameters. For example, the 'Thermostat UI Data' message class defines a structure for encoding data displayed on a thermostat (heating setpoint, cooling setpoint, temperature, etc). Each message class has been assigned a unique 14 bit message class ID. Each message class has a specification that includes its message class ID, all RedLink parameters that are its members, the position within a message frame where each member parameter is located, and the encoding/decoding of each member parameter.   The specification for message classes are in the document, Residential Network Protocol (RNP). Many Honeywell protocols use RNP message classes so the document includes significantly more message classes than RedLink currently uses.

Message Class Instances

A message class's structure is often used multiple times in a system.   Each instance of the message class is differentiated by a 15 bit instanceID. For example, a system with a zoning panel has multiple thermostats, each with their own value of setpoint, system switch, fan switch, displayed temperature, etc. These parameters are all members of the Thermostat UI Data message class. Instances of this message class are differentiated by a zone number configured by the installer. There are other message classes with multiple instances that have no meaningful parameter to differentiate them so their instanceIDs exist only as an abstract unique value.   For example, a thermostat can average indoor temperatures received from several sensors. The indoor temperature is a member of the 'Manuf0 Specific 1' message class. The instanceID of this message class has no inherent meaning other than to differentiate each sensor from the others. These instanceIDs are prone to duplication if manually assigned, so are automatically assigned by the system.

Enrolling Devices

Enrollment is the mechanism by which clients learn about their host and hosts learn about their clients (clients do not learn about other clients during enrollment). When a configuration has multiple hosts, enrollment is also used to identify which clients are associated with which hosts. To the installer, enrollment is a manual 'touch and play' process during system commissioning. When there are multiple hosts, the installer must be able to identify which clients go with which hosts.

Enrollment occurs between a host and a client.

Serial Interface Overview

RedLINK serial interface connects with a local or RS232 remotely connected application processor. This interface is full duplex.

The data rate is 19200 baud and character encoding is: 8-bit data, 1 start bit, 1 stop bit, no parity, LSB first. On board connection with an application process defines approximately 3–3.3 volts as the signal condition *mark*, and has the functional significance of OFF. On board connection defines zero volts as the signal condition *space*, and has the function ON. Off-board application processors and RFTKs connect using RS232 driver chips and reverse the signal voltage in the interface.

Security Objectives

Information system security reduces the risk of damage from attacks. This is done by identifying the threats to the system, identifying the system's vulnerabilities to these threats, and providing countermeasures. The countermeasures reduce vulnerabilities directly, counteract threats, or recover from successful attacks.

The following are the threats identified due to the nature of the protocol specification and it's implementation. Considering the risks, It is recommended to configure the Jace, Wireless Adaptor client, Equipment Interface Module and / or the Thermostat in a closed network infrastructure accessible only by those within it.

Threat Name	Category	Description
Data Flow Sniffing	Information Disclosure	Data flowing across may be sniffed by an attacker. Depending on what type of data an attacker can read, it may be used to attack other parts of the system or simply be a disclosure of information leading to compliance violations. Consider encrypting the data flow.
Integrity Threat	Spoofing	Unauthorized changes of information during transmission, Consider using a standard authentication mechanism to identify the destination process.

Defects fixed with the release of this driver

Column1	Summary	Comment	Resolution
REDLD-4	Sometimes "Redlink device manager" screen gets hanged on when we try to add redlink host devices manually.	This is probably same issue as REDLD-12	Fixed
REDLD-5	Configured Thermostat name does not reflect on the "Redlink device manager" screen immediately.	This is not a requirement. However it may improve the user experience.	Fixed
REDLD-6	New device icon can be provided for prestige and Vision Pro thermostats instead of default one	This is not a requirement. However it may improve the user experience.	Fixed
REDLD-7	When power failure occurs to thermostat, there is no indication of power failure in the "Redlink Device Manager" screen so that user is aware of it.	Host will be marked down when round robin cycles to access it.	reject
REDLD-8	The points take a long period of time to reach Stale state when a power failure happens to thermostats in the network	The time till points are marked stale is set in the tuning policy - the stale time should be set long enough to insure round robin can complete its cycle.	reject
REDLD-9	Whenever a station is restarted, there are many errors appearing in the station console which is confusing for user. Please find the attachment	Thermostat was sending unhandled query	Fixed
REDLD-10	After discovering and renaming the VisionPro thermostat, a duplicate device gets added to the redlink device manager unnecessarily	Could only create duplicate entries by pressing connect button on rfi twice. Add checks to deal with this scenario	Fixed
REDLD-11	Station gets disconnected while performing parallel operations(Discovering of redlink devices and upload of bacnet spyder devices). Please find the console attachment.	This appears to be the same issue as REDLD-4. The stack dump indicates the same circular calls. Need someone there to retest.	
REDLD-12	Niagara Workbench gets hanged while working in multiple tabs	Fixed lockup condition in RedlinkEnrollAgent	Fixed
REDLD-13	System mode command of wireless thermostats are not working from niagara	ThermostatUiData.sysSwitch not include in update list	Fixed