

Application Note 3047

USNAP Interface Commands

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Introduction

The USNAP Interface (PAC-WHS01UP-E) is a Mitsubishi Electric product that allows the user to participate in Demand Response events. The Demand Response events are initiated by the Utility and communicated through the USNAP interface to the indoor unit.

Demand response events are where the utility initiates a load shed on all connected devices for a pre-determined amount of time. This is done by changing the set point on customer equipment. More often than not, Utilities will give advanced warning to allow customers to pre-cool their space. In order to keep customer satisfaction high, Utilities usually have financial incentives for participating in events. These incentives can vary from Utility to Utility.

The customer also has the ability to “Opt-Out” of the demand response event at any time. If the customer changes mode or the set point, the USNAP Interface will interpret this as the user wanting to Opt-Out and send this information to the Utility. The equipment will return to normal operation.

NOTE: The Utility may have a limit to the amount of times that a customer can Opt-Out. If the customer surpasses this amount, they may not be able to receive any financial benefits from the program. Please check with the customer’s Utility for more details.

USNAP Interface

The USNAP Interface connects via CN105 on the indoor unit and will need to be installed by a professional. The USNAP interface connects with the Utility using a CTA-2045 DC form factor Universal Communication Module (UCM). The UCM connects to the customer’s wireless router and then sends/receives information to and from the Utility. The UCM connects to the USNAP Interface by being inserted into a slot located at the top of the USNAP Interface. Installing the UCM into the USNAP Interface can be completed by the homeowner. Please see figure 1 for an example of how to insert the UCM into the USNAP Interface. More information is available in the [instruction manual](#).

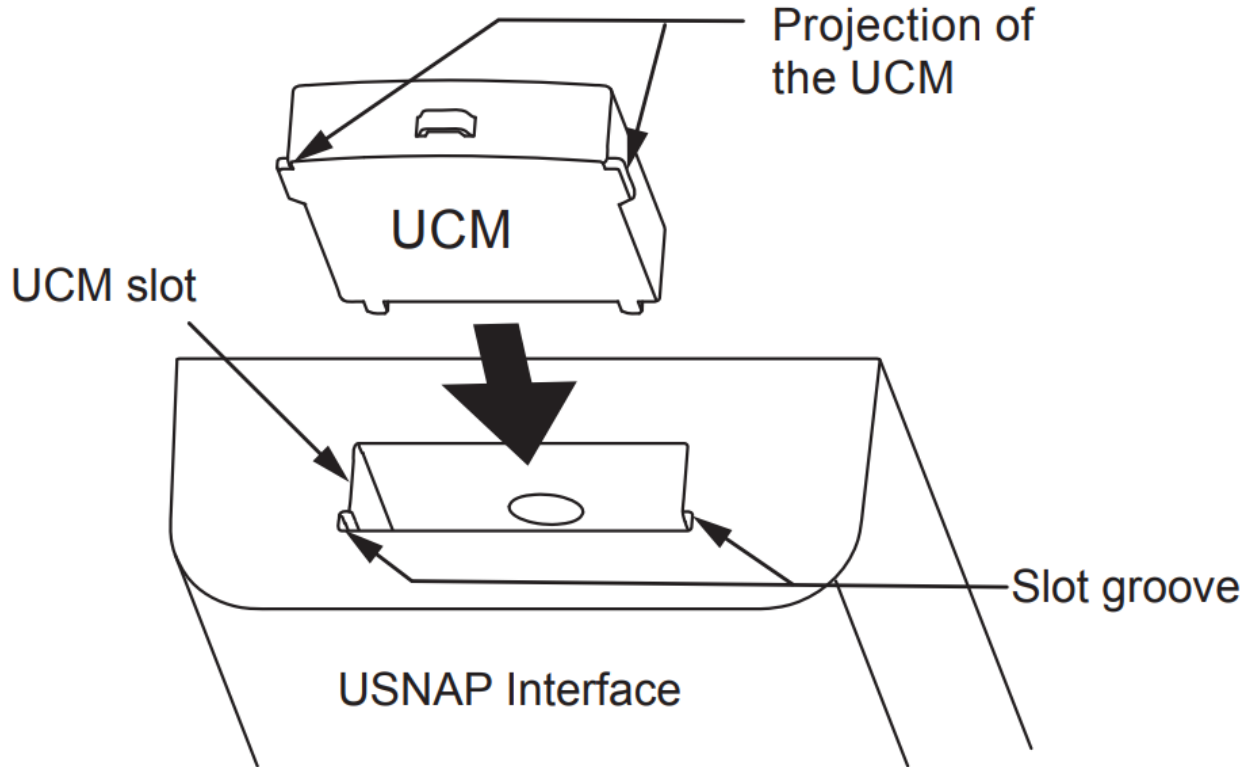


Figure 1: Installation of UCM into USNAP Interface

Command List

The USNAP Interface is able to support Demand Response commands per the CTA-2045 Standard titled *ANSI/CEA Standard, Modular Communications Interface for Energy management, ANSI/CEA-2045, February 2013*. A list of the supported commands can be seen in Tables 1 through 3 and a visual representation of these commands can be viewed in Figure 2.

Table 1: Data-Link Messages

Command Name	Description
Link ACK	Sent from UCM or SGD to acknowledge a message
Link NAK	Sent from UCM or SGD to indicate an invalid message received with appropriate error code
Power Level indicator	Sent from UCM to SGD to request a higher power level. USNAP Adapter will allow up to 250mA average power.

Table 2: Basic DR Messages

Command Name	Description
Shed	Sent from UCM to SGD to begin a shed event which causes USNAP Adapter to apply Temperature Offset to setpoint
End Shed	Sent from UCM to SGD to end a shed event and remove any Temperature Offset applied to setpoint
Basic Application ACK	Sent to acknowledge support for the command
Basic Application NAAK	Sent to Nack command with appropriate error code
Critical Peak Event	Sent from UCM to SGD doing the same thing as Shed
Grid Emergency	Sent from UCM to SGD to turn unit off. An End Shed event will turn unit back on
Outside Comm Connection Status	Send from UCM to SGD causing change in LED display on SGD
Customer Override	Sent from SGD to UCM to indicate that the customer changed setpoint or otherwise made a change using a remote or other local control during a Shed Event.
Query Operational State	Sent from UCM to SGD to request operational state
State Query Response	Sent from SGD to UCM to indicate operational state

Table 3: Intermediate DR Application Messages

Command Name	Description
Get Information Request	Sent from UCM to SGD to request information about SGD
Get Information Reply	Sent from SGD to UCM to supply information: <ul style="list-style-type: none"> ○ Version = 0x00, 0x00 ○ Device Type = 0x0004 or 0x0007 depending on cooling only or heat pump ○ Device Revision = 0x00 ○ Capability Bitmap = 0x0008 ○ Model and Serial number = 0x000 ○ Firmware Year = 0x11
Get Temperature Offset Request	Sent from UCM to SGD to request temperature offset stored in USNAP Adapter
Get Temperature Offset Reply	Sent from SGD to UCM to provide stored temperature offset
Set Temperature Offset Request	Sent from UCM to SGD to store a new temperature offset in USNAP Adapter
Set Temperature Offset Reply	Sent from SGD to UCM to acknowledge storing a new temperature offset in the USNAP Adapter
Get Set-Point Request	Sent from UCM to SGD
Get Set-Point Reply	Sent from SGD to UCM sending both a heating and cooling set-point if a heat pump
Set Set-Point Request	Send from UCM to SGD to set set-point(s)
Set Set-Point Reply	Sent from SGD to UCM to indicate successful setting of set-point(s)

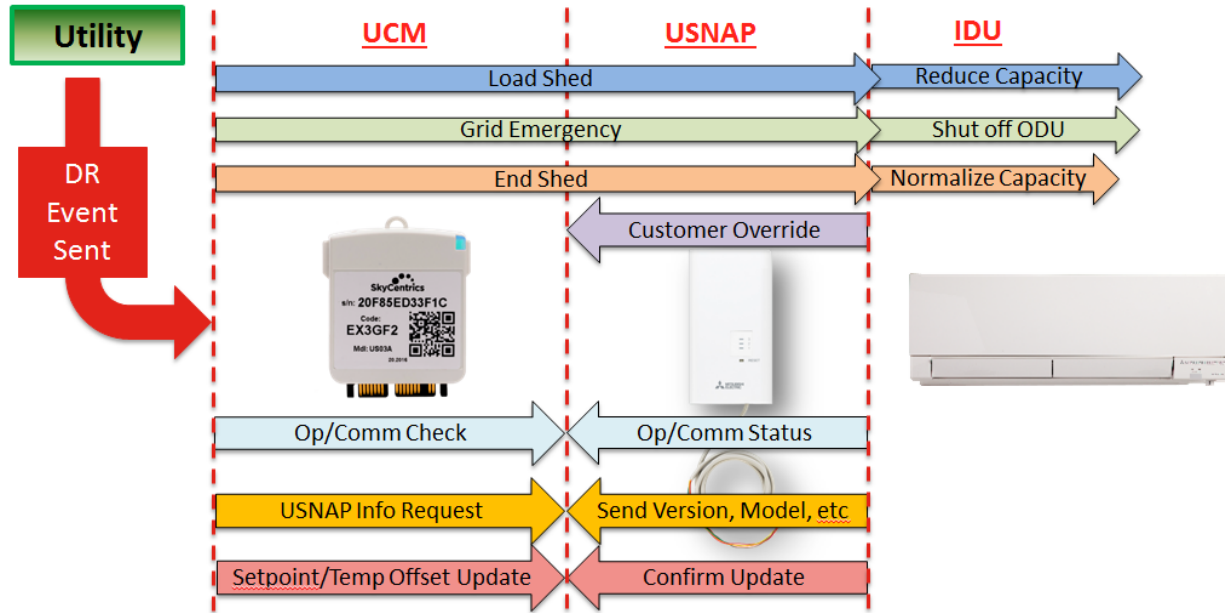


Figure 2: Communication from Utility to Indoor Unit