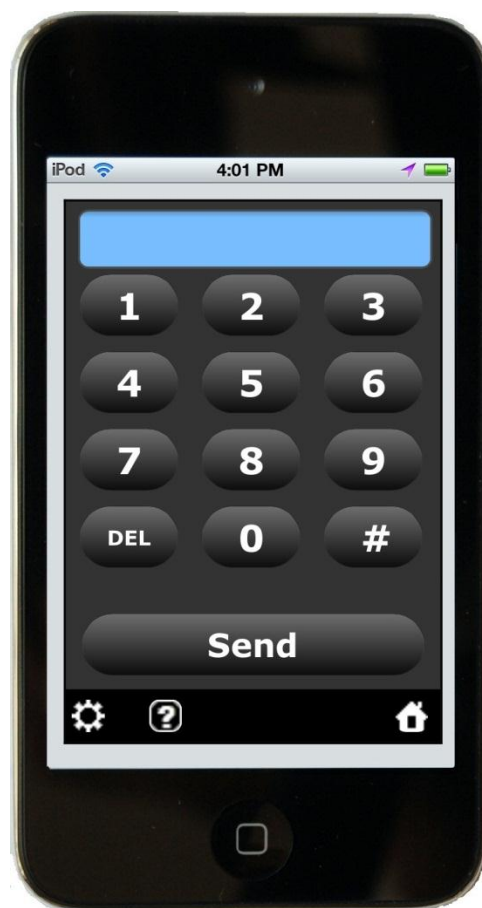


MI FREEDOM



Use your smartphone as
a smart FREEDOM controller

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What Is MI FREEDOM

MI FREEDOM is Rain Bird FREEDOM user interface in MI Series 4.0 working on smartphones, not handheld radios. In addition to executing traditional **action** FREEDOM command set, MI FREEDOM also adds new **status** and **data** command sets for users to get irrigation status and edit data of stations, programs and schedules. Compared to handheld radio FREEDOM, MI FREEDOM does not require repeater hardware, frequency license and site survey. If you have experience of using Rain Bird FREEDOM system, MI FREEDOM will extend your experience from handheld radios to smartphones smoothly. You will find more smart functions in MI FREEDOM and easier to use with fun.

- MI FREEDOM provides two smartphone user interfaces for users to implement FREEDOM commands: (1) Handheld radio keypad user interface for users with years of handheld radio keypad experience; (2) Soft Keyboard user interface for users with good smartphone virtual keyboard skills.
- MI FREEDOM has no time limitation to push a user to compose a command. In the handheld radio FREEDOM system, the central-control starts waiting for a command when the user presses leading ##. The handheld radio sends every single number to the central-control when the user presses keys. If a wrong key was pressed, it was also immediately sent to the central-control. The user has no time to correct and has to start over. If the user cannot finish all numbers for a command in limited time, the central-control drops this incomplete command and starts waiting for next command. MI FREEDOM totally removes this limitation and does not send single numbers. It sends a command only when the user finishes it and presses Send button. Without time pressure, a user can easily compose, check and change a command before sending it.
- MI FREEDOM never sends wrong commands. After a user presses Send button, MI FREEDOM will check the command's syntax and arguments. A command will not be sent if it has something wrong. MI FREEDOM also checks arguments (e.g., area, stations, program, or schedules). If any argument has not been found in central database, the command will not be sent. A message will be displayed to explain what's wrong.
- After a command is sent, MI FREEDOM interprets the numeric command to meaningful message, plus showing command's execution status. The last sent action command's arguments are remembered and can be "recalled" for you to correct the sent command.
- MI FREEDOM ignores leading and ending delimiters ## to save numbers' input. A user can start and end a command with ## as using handheld radio, but this is not required. For example, "1#1#2" is equal to "##1#1#2##" for MI FREEDOM.

- MI FREEDOM allows one or more delimiter #s used between arguments. If you miss-type more delimiters in a command, just keep your typing and no need to correct. MI FREEDOM understands this. For example, “1###1####2” is equal to “1#1#2” for MI FREEDOM.

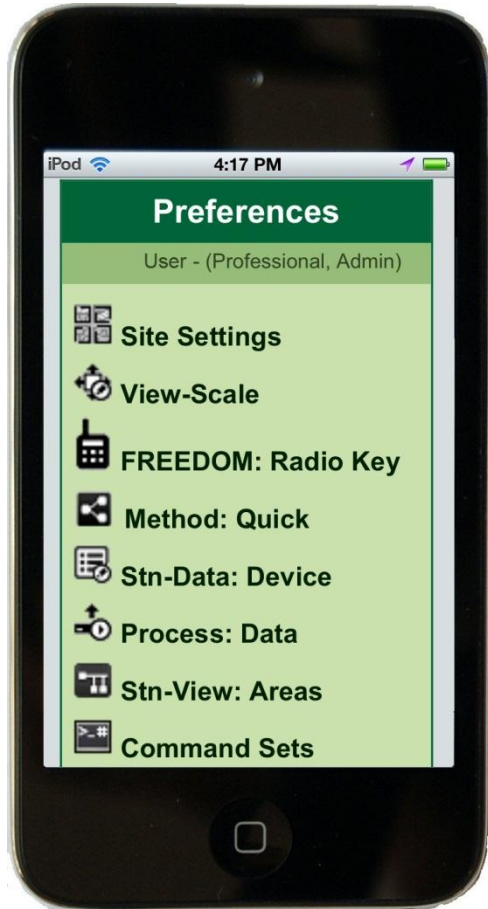
Comparison of MI FREEDOM and Radio FREEDOM


MI FREEDOM	Radio FREEDOM
Action Commands: Turn On/Off, Pause, Resume, Advance station, program, and schedule.	Action Commands: Turn On/Off, Pause, Resume, Advance station, program, and schedule.
Status Commands: Get irrigation status of course, hole, area, station, program, and schedule.	N/A
Data Commands: Edit data of station, program, and schedule.	N/A
Undo last sent action command.	N/A
View sent command log.	N/A
Guarantee correct command syntax and target objects exist when sending a command.	N/A
Allow any number of delimiters to compose a command.	N/A
Interpret a numeric command to meaningful message and showing execution result.	Radio beep sound to indicate a command succeeded or failed.
Dual user interfaces: Radio keypad and soft keyboard.	Single user interfaces: Radio keypad.
Require Internet connection and smartphones.	No need
No need	Require repeater hardware, frequency license, site survey, and handheld radios.

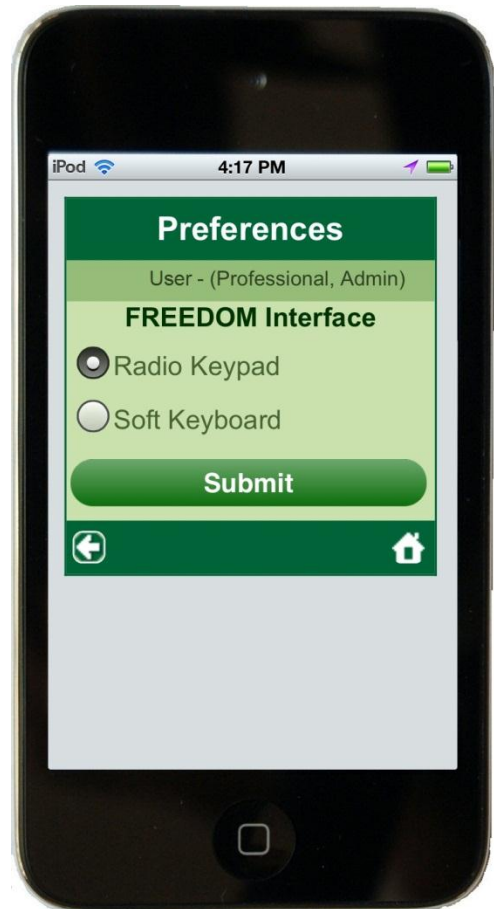
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User Interface Preferences

Default MI FREEDOM user interface in MI is handheld radio keypad user interface. This is for users who have years of handheld radio keypad experience. If prefer to use smartphone’s virtual keyboard provided, you can change the default FREEDOM user interface to using soft keyboard.



At toolbar of the MI Home page, tap  icon and “Preferences” page will display (screenshot at left). Tap “FREEDOM: Radio Key” and “**FREEDOM Interface**” page will display (screenshot below).





Select “Soft Keyboard” and tap “Submit” button. The default MI FREEDOM user interface is set to using soft keyboard from your smartphone. You can set default MI FREEDOM user interface to handheld radio keypad using the same process.

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Radio Keypad Interface


Assume your default MI FREEDOM user interface is handheld radio keypad. At the MI Home page, tap “FREEDOM” link and a handheld radio keypad will display as screenshot below.



To avoid miss-tapping command keys and increase efficiency, the screen hides current FREEDOM settings and not-frequently-used features to provide maximum space for the keypad. Tap  icon to show these settings and features (screenshot below). To hide the settings screen section, tap  icon again.

In settings screen section,

- **Clear** button is used to clear all current inputs.

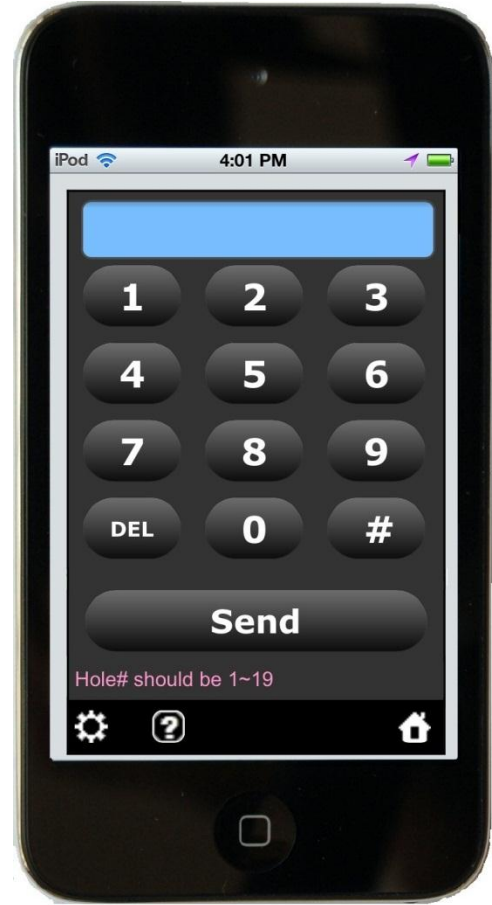
The  button is used to help “undo” last sent command.



- Reference dropdown box is used to set Area or Satellite reference. Current FREEDOM reference is Area.
- Current communication method is Automatic that works for most mobile browsers. If you need to change it, see [Asynchronous Communications](#) for details.
- Current course number is default for Area reference. You can change the current course

number by tapping “Course-Number” link (Course-1 in the screenshot).


- Current box number is default for Satellite reference. You can change current box number by tapping “Box-Number” link (Box-1 in the screenshot). If your irrigation system does not have satellite field interface devices, the satellite reference and box number will not be displayed.
- Tap number keys to compose your command as you do in a real handheld radio keypad. If you pressed a wrong key, press **DEL** key to erase it. If you want delete all inputs and start over, tap **Clear** button to clear them.



- After the command and its arguments are completed, press **Send** button to send the command. MI FREEDOM will check your command. If any syntax error or wrong argument is found, the command will not be sent. A message will be displayed to explain what’s wrong. Screenshot above is an example.

- After a command is sent, MI FREEDOM interprets the numeric command to meaningful message for you. If sending command is succeeded, the Send button will show green “Send”. If failed, the “Send” text is red. You will also see detail command status at lower portion of the radio keypad. On screenshot at left, the sent command 1#1#1#2#4#3 is interpreted as “Turn On stations 1G2 and 1G4 at course-1 for 3 minutes. The command execution is succeeded.” 1G2 (1, 1-4-2) means the station 1G2 is connected to box-1, group-1, satellite-4, and station-4.

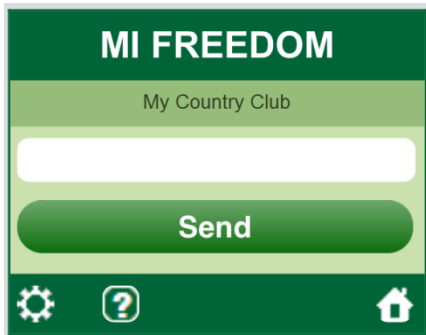
Quick Tips



- You do not need to input leading and ending ## for a command although you can use them as in real handheld radio. For example, 1#1#2 is equal to ##1#1#2##.
- If you miss-tap more #s in a command, just keep your taping and no need to correct. MI FREEDOM understands this. For example, #1###1##2 is equal to 1#1#2.
- If you forget a command, tap  icon and all FREEDOM commands will be displayed in Help screen for you.
- [Procedure to undo a sent command.](#)


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Soft Keyboard Interface

Assume your default MI FREEDOM user interface is Soft Keyboard. At the MI Home page, tap “FREEDOM” link and MI FREEDOM page will display as screenshot.



To avoid miss-tapping command keys and increase efficiency, the screen hides current FREEDOM settings and not-frequently-used features. Tap  icon to show these settings and features (screenshot next page). To hide the settings screen section, tap  icon again.

- In the FREEDOM settings screen section (screenshot next page), the  button is used to help “[undo](#)” last sent command.
- Reference dropdown box is used to set Area or Satellite reference. Current FREEDOM reference is Area.
- Current communication method is Automatic that works for most mobile browsers. If you need to change it, see [Asynchronous Communications](#) for details.

- Current course number is default for Area reference. You can change the current course number by tapping “Course-Number” link (Course-1 in the screenshot).
- Current box number is default for Satellite reference. You can change current box number by tapping “Box-Number” link (Box-1 in the screenshot). If your irrigation system does not have satellite field interface devices, the satellite reference and box number will not be displayed

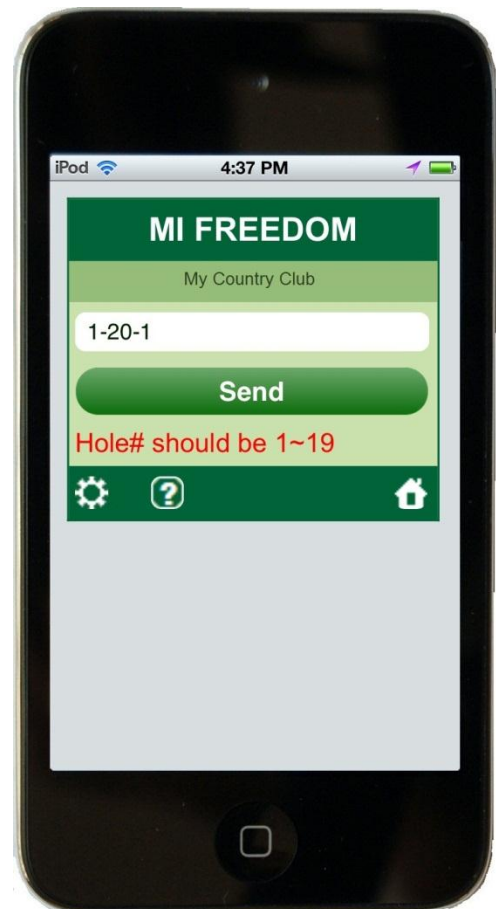


- Command delimiter is user definable (‘-’ in the screenshot). FREEDOM default delimiter # may not be on your smartphone’s soft numeric keyboard. You can define any character on the numeric keyboard as the delimiter, for example, - / \$ & @ “.
- Tap command input box and smartphone’s soft keyboard will popup. Screenshot at left is Apple iPhone soft numeric keyboard. Characters at edges are good candidates for the delimiter because they are easier to access and have less chance to be miss-hit. Character ‘-’ at left edge is selected as delimiter. Quotation mark at right edge is also a good delimiter candidate. So does white space character because Space Bar is easy to hit.


- If you put your smartphone in horizontal, the soft keyboard will become bigger and you will get two benefits: (1) Less chance in miss-typing; (2) Easy tap with two hands.



- Tap number keys to compose your command. After the command and its arguments are completed, press **Send** button to send the command.
- MI FREEDOM will check your command. If any syntax error or wrong argument is found, the command will not be sent. A message will be displayed to explain what's wrong (screenshot at right).
- After a command is sent, MI FREEDOM interprets the numeric command to meaningful message for you. You will see the command status on screen. On screenshot below, the sent command 1-1-1-2-4-3 is interpreted as “Turn On stations 1G2 and 1G4 at course-1 for 3 minutes. The command execution is succeeded.” 1G2 (1, 1-4-2) means the station 1G2 is connected to box-1, group-1, satellite-4, and station-4.



Quick Tips

- You do not need to input leading and ending delimiters for a command although you can use them. For example, 1-1-2 is equal to --1-1-2--.
- If you miss-tap more delimiters in a command, just keep your tapping and no need to correct. MI FREEDOM understands this. For example, -1---1--2 is equal to 1-1-2.
- If you forget a command, tap  icon and all FREEDOM commands will be displayed in Help screen for you.
- [Procedure to undo a sent command.](#)



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Asynchronous Communications


MI FREEDOM uses a latest asynchronous communications technology to send commands and retrieve data between mobile devices and the MI server at irrigation computer. The technology transfers only minimum data asynchronously in the background without interfering behavior of user interfaces. You will find MI FREEDOM has fast communications to the server and behaves as a native mobile app.

Although popular mobile devices support the asynchronous communications technology, MI Series 4.0 still provides synchronous communications method to ensure MI FREEDOM works on most all recent mobile devices.

Method	MI FREEDOM Communications
Asynchronous	Transfer only minimum data between mobile devices and the server in the background. iOS Safari 4.0 or later and Android 2.3 or later browsers support this method.
Synchronous	Send commands to the server and wait for data feedback from the server. This method works on almost all recent browsers.
Automatic	If Web browser is iOS Safari 4.0 or later, Android 2.3 or later, the MI selects Asynchronous method. Otherwise, Synchronous method is selected.

Default communication method for MI FREEDOM is Automatic in MI Series 4.0. If your mobile browser is iOS Safari 4.0 or later/Android 2.3 or later, just keep the Automatic method. Otherwise, you may test and change MI FREEDOM communication method in case of:

- Asynchronous method does not work in your browser for some reasons.
- Synchronous method works in your browser, but you want to try Asynchronous method to get better communication performance.

Tap  icon on toolbar to show MI FREEDOM settings. Tap “**Communication**” dropdown list to change MI FREEDOM communication method. After the method is changed, you must send a command to test the method. If Asynchronous method does not work in your browser, you have to use Synchronous method. If Cookies settings are turned on in your Web browser, your selected communication method will be remembered in the browser.



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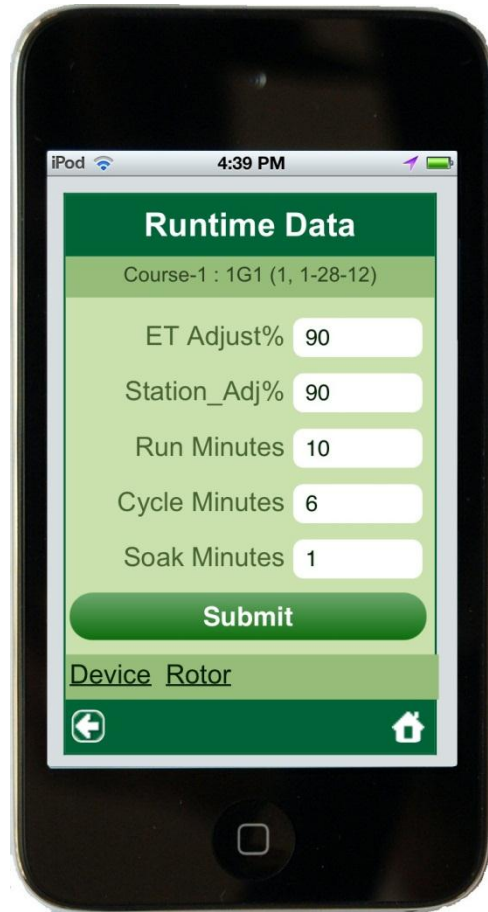
Extended FREEDOM Commands

In addition to implementing traditional Rain Bird FREEDOM commands, MI FREEDOM also created two new sets of commands for users to edit irrigation data and get irrigation status.

Data Commands

- 31 = Edit Station Runtime Data
- 32 = Edit Station Device Data
- 33 = Edit Station Rotor Data
- 34 = Edit Station ICM Addresses
- 37 = Edit Program or Schedule Data

The data commands use the same syntax as existing action commands. For example, to edit runtime data of station 1 in Green area (Area number = 1) of Hole 1 on current course, input 31#1#1#1 in keypad. The Station Runtime Data page will display on screen for you to edit (see example screenshot at right).



Status Commands

- 51 = Get Area or Station Status
- 57 = Get Program or Schedule Status

The status commands use the same syntax as existing action commands. For example, to get status of station 1 in Green area (Area number = 1) of Hole 1 on current course, input 51#1#1#1 in keypad. The status message will display on the keypad (see example screenshot below right).

To get status of Program-1, input 57#1 in keypad. The status message will display on the keypad. If the program is active, you will see list of active schedules in the program-1 (see example screenshot below).





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Command Options

Override Default Run Minute

If central-control application received Turn On or Block On command for a station or an area without run minute included in the command, 5 minutes will be used as default for the command. If you want to use your own default run minute to override the default in the central-control application, MI Command Options feature allows you to do it.

At MI FREEDOM screen, tap  icon (at Quick-Method screen, tap  icon) to show settings screen (screenshot right). Tap **Options** link to display “Command Options” screen (screenshot below) where you can put your own override minute. This override minute will be automatically added into your Turn On or Block On command if no run minute included in the command.

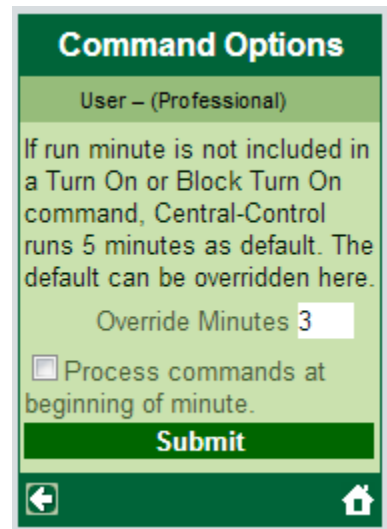
If you do not want to override the default run minute in the central-control application, simply keep Override Minutes empty or set to “0”.



Change Command Processing Time

If your central-control application is version 7.6 or later, FREEDOM commands can be processed **immediately** or **at beginning of minute**. This feature applies to all commands in MI. You can choose which command processing time at FREEDOM simulator in the central-control application. You can also change command processing time at MI Command Options screen (screenshot right).

This feature is not available on MI Command Options screen if your central-control application version is earlier than 7.6.



Command Sets

In addition to implementing traditional action FREEDOM commands as handheld radio, MI FREEDOM also created new data and status commands. MI FREEDOM also allows:

- Ignore or use leading and ending delimiters ##.
- One or more delimiter #s between arguments.

Traditional Commands

Command	Syntax
Station 1 = Turn On 2 = Turn Off 3 = Block Turn On 4 = Block Advance 5 = Pause 6 = Resume	Area Reference Command # Hole # Area # Station-1 # ... # Station-N # Minute Command # Hole # Area # Minute (all stations in the area) Command # Hole # Area (all stations in the area for 5 minutes) 3 # Hole # Area # Station-Begin # Station-End # Minute Satellite Reference Command # Group # Satellite # Station-1 # ... # Station-N # Minute Command # Group # Satellite # Minute (all stations in the satellite) Command # Group # Satellite (all stations in the satellite for 5 minutes) None Golf: Hole = Location, Area = Irrigation-Type
Program 71 = Turn On 72 = Turn Off 74 = Advance 75 = Pause 76 = Resume	Command # Program # Schedule-1 # ... # Schedule-N Command # Program
Cancel All 00 = Turn Off All	Turn off all stations in the system
Reference 21 = Set Reference	21 # 0 = Area Reference 21 # 1 = Satellite Reference
System Mode 20 = Set Mode	20 # 0 = Auto Off 20 # 1 = Auto On
Current Course 8 = Set Course	8 # Course Number

Extended Commands

Command	Syntax
<p>Station Data</p> <p>31 = Runtime 32 = Device 33 = Rotor 34 = ICM Address</p>	<p>Command # Hole # Area # Station</p> <p>Note: Area Reference Only None Golf: Hole = Location, Area = Irrigation-Type</p>
<p>Station Status</p> <p>51 = Get Status</p>	<p>Command # Hole # Area # Station Command # Hole # Area Command # Hole Command (Get course/site status)</p> <p>Note: Area Reference Only None Golf: Hole = Location, Area = Irrigation-Type</p>
<p>Program Data</p> <p>37 = Data</p>	<p>Command # Program # Schedule Command # Program</p>
<p>Program Status</p> <p>57 = Status</p>	<p>Command # Program # Schedule Command # Program</p>

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Command Examples

To help you understand MI FREEDOM commands, some sample commands are listed below. These samples are not a complete list of all possible commands. Rather, these samples show what are possible to make commands in simple and smart ways.

Turn On Program

Turn on program 2 on current course. All commands below are allowed and do the same job.

```
71#2
##71#2##
71###2
##71##2
###71#2#####
```

Turn On Schedules

Turn on schedules 4 and 7 of program 2 on current course. All commands below are allowed and do the same job.

```
71#2#4#7
##71#2#4#7##
71###2#####4##7
##71##2###4##7
###71#2#####4##7##
```

Turn On Station

Turn on station 3 in Green area (Area number = 1) of Hole 2 on current course for six minutes. All commands below are allowed and do the same job.

```
1#2#1#3#6
##1#2#1#3#6##
1##2#####1#3#6
#####1#2#1##3#6##
```

Turn On Stations

Turn on stations 3, 4, and 7 in Green area (Area number = 1) of Hole 2 on current course for six minutes. All commands below are allowed and do the same job.

```
1#2#1#3#4#7#6
##1#2#1#3#4#7#6##
1##2#####1#3#4#7##6
##1#2#####1#3#4#7###6
```

Block Turn On Stations

Turn on stations from 3 to 7 (stations 3, 4, 5, 6, 7) in Green area (Area number = 1) of Hole 2 on current course for two minutes. All commands below are allowed and do the same job.

3#2#1#3#7#2

##3#2#1#3#7#2##

3##2#####1#3#7##2

####3#2#1##3#7##2##

Turn On All Stations in Area

Turn on all stations on Hole 4, Green area (number = 1) on current course for default minutes (5 minutes). All commands below are allowed and do the same job.

1#4#1

##1#4#1##

1##4####1

###1#4#1##

Edit Station Data

Edit runtime data of station 1 in Green area (Area number = 1) of Hole 1 on current course. All commands below are allowed and do the same job.

31#1#1#1

##31#1#1#1##

###31#####1#1#1

Get Station Status

Get status of Green area (Area number = 1) of Hole 1 on current course. All commands below are allowed and do the same job.

51#1#1

##51#1#1##

#51###1#1

Get Program Status

Get status of Program-1. All commands below are allowed and do the same job.

57#1


##57#1##

#57###1##




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Undo Sent Command




After an action command was sent and executed, you cannot directly recall the command because irrigation status of the command objects (e.g., a program/schedule, or area, or stations) was changed. If you want to undo the command, a simple way is to send another command to restore the changed irrigation status back to original status.



To help you undo a sent command, MI FREEDOM remembers arguments of last sent action command (not for status and data commands because they do not change irrigation status). Tapping  button will bring the remembered arguments back to screen without re-inputs.

Below are steps to undo a sent action command.

1. Tap  icon to show  button if it is invisible.
2. You must know original irrigation status whether it was on, off, pause, or other status.
3. According to the original status, input a corresponding action command without arguments. For example, if original status was off, input Off command; if original status was pause, input Pause command.
4. Tap  button to bring last sent arguments back and append to the command.
5. Tap **Send** button to send the command and restore the changed irrigation status back to original.

For example, after sent 71#2#1 (turn on Schedule-1 of Program-2), you want to undo the command. Here are steps.

1. Tap  icon to show  button if it is invisible.
2. You know Schedule-1 of Program-2 had been off before last command was sent.
3. Input Program Off command 72.
4. Tap  button to bring last sent arguments #2#1 back. You will see whole command 72#2#1 on screen.
5. Tap **Send** button to turn off Schedule-1 of Program-2.

Note:  button only brings last sent arguments when a command is input **without** arguments. Otherwise, a reminder will display on screen above  button.

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