Chapter 4
Setup

Because all irrigation applications are not identical, the Evolution DX2 controller has been designed to allow users to establish a wide variety of individual programmable options. These options include changing configuration of programs, Individual Station Control (ISC), irrigation stations, the controller, and sensors. The setup function provides the mechanism for tailoring the Evolution DX2 controller operation to a specific irrigation application.

> *Note:*　　*Factory defaults have been established to allow most users to skip the setup options and proceed to basic programming (Chapter 5: Program Entry). The following table summarizes the setup options and factory default values.*

**Chapter 4:
Setup**

System Defaults

Table 1: Setup Options and System Defaults

Setup	Function	Options	Defaults
Program	Cycle Mode	start times, continuous cycle	start times
	Overlap Protection	on, off	on
	Irrigation Program	yes, no	yes
	Omit by Date	on, off	on
	Station Delay Time	0-255, 0=Off	0
	Time Format	HH:MM, MM:SS	HH:MM
	Water Limit Reached	give warning, stop watering	give warning
	Master Valve Used	MV1, MV2, normally open MV, none	Dependent upon power-on initialization (see Chapter 3)
	Uses Pump	uses a pump, uses no pump	Set at initialization (see Chapter 3)
	State of Master Valve between Stations	on, off	on
	Master Valve Delay Turn On Time	0-600 seconds	0

Table 1: Setup Options and System Defaults (continued)

| Setup	Function	Options	Defaults
ISC	Cycle Mode	start times, continuous cycle	start times
	Overlap Protection	on, off	on
	Irrigation Program	yes, no	yes
	Omit by Date	on, off	on
	Station Delay Time	0-255, 0=Off	0
	Time Format	HH:MM, MM:SS	HH:MM
	Water Limit Reached	give warning, stop watering	give warning
	Master Valve Used	MV1, MV2, normally open MV, none	Set at initialization (see Chapter 3)
	Pump	uses pump, uses no pump	Set at initialization (see Chapter 3)
	State of Master Valve between Stations	on, off	on
	Master Valve Delay Turn On Time	0-600 seconds	0

Table 1: Setup Options and System Defaults (continued)

Setup	Function	Options	Defaults
Stations	Low Limit Flow Checking	enable, disable	disable
	Upper Limit Flow Checking	enable, disable	disable
	Low Limit Current Check	enable, disable	disable
	Upper Limit Current Check	enable, disable	enable
	Maximum Current Limit	0.0 to 1.0 amps	1.0
	Minimum Current Limit	0.0 to 1.0 amps	0.05
	Maximum Flow Limit	0 to 2000 gallons per minute	500
	Minimum Flow Limit	0 to 2000 gallons per minute	0
	Type	normal, injector	normal

Table 1: Setup Options and System Defaults (continued)

Setup	Function	Options	Defaults
Controller	Main Line Flow Limit	0 to 2000 gallons per minute	2000
	Monthly Water Limit	1-9,999,999 gallons, none	none
	Flow Meter used for Limit Comparisons	meter 1, meter 2, sum of meters 1 and 2	meter 1
	Flow Delay before Limit Checks	1-6 minutes	2 minutes
	Unscheduled Limit	(0-2000) gallons	200
	Omit by Date (15 allowed)	any day of the year	none
	Time	12 hour, 24 hour	12 hour
	Date	month/day/year, day/month/year	month/day/year
	Language	English, Espanol	English
	Access Code	none/set	none

Table 1: Setup Options and System Defaults (continued)

Setup	Functions	Options	Defaults
Configuration	Operational Modes	satellite, submaster, Flow Max	satellite
	Communications Type (If submaster is selected mode)	Radio/ wire Phone Trunk	Radio/wire
	Address (If submaster is selected mode)	0-255	239
Sensors	Program Assignment Moisture Sensor	1- 12	none
	Trip Points (1-12)	0-200	0
	Sensor Status	enabled disabled	disabled
	Flow 1- K Value	0-56000	0
	Flow 1- Offset Value	0-26000	0
	Flow 2- K Value	0-56000	0
	Flow 2- Offset Value	0-26000	0

```
F1 Main Menu
F5 Setup
F1      Program
```
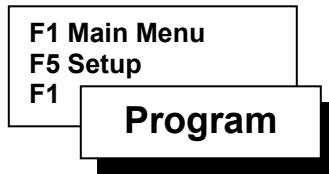
Program

Setup Program is used to specify operational controls for the programs used by the Evolution DX2. The following parameters and options are available in the Setup Program:

- Cycle Mode: Select start times or continuous cycle

- Overlap Protection: Select station start time overlap

- Irrigation Program: If NO is selected for a program, then the controller Rain Shutdown mode will not affect program operation.

- Omit By Date Enable: Select non-watering dates.

- Station Delay Time - Set delay time between station watering start times.

- Time Format - Select time in hours and minutes or minutes and seconds.

- At Water Limit - Select water control option to stop watering or give warning if water limit is exceeded.

- Master Valve - Select master valve configuration.

- Pump - Select pump configuration.

- Master Valve On Between Stations - On or Off.

- Master Valve Delay Turn On Time - Set delay of turn on time.

The Evolution DX2 Controller allows each program to have its own unique set of setup parameters. Individual setup parameters on a per program basis provide absolute programming independence.

Program Setup Procedure

Step 1   Advance to the program entry screen through the following sequence:

> **F1=Main Menu**
> **F5=Setup**
> **F1=Program**

```
PROGRAM NUMBERS: P
ENTER PROGRAM NUMBER (1-12)                    | ↑ |
```

Figure 17: Program Entry

Step 2   Enter the program number, the program number must be between 1 and 12, then press ENTER.

Step 3   **Cycle Mode**

Press F1=CHANGE OPTION to select one of the two following options:

- START TIMES - Start a program based upon user-defined (programmed) start times (up to 8 start times available).

- CONTINUOUS CYCLE - Allows a program to be run continuously during a user defined water window (start/end time). Upon completion of the first cycle, a user defined soak delay occurs and the program starts again. Operation repeats in this fashion until the end time is reached.

```
┌─────────────────────────────────────────────────┐
│ P # CYCLE MODE: START TIMES                       │
│  | F1 | =CHANGE OPTION              | ↓ |  | ↑ |  │
└─────────────────────────────────────────────────┘
```

Figure 18: Cycle Mode

Step 4   Overlap Protection

Press the Down Arrow to display the Overlap Protection option screen.

Overlap protection prevents multiple stations from being on simultaneously if the station start times overlap.

Select one of the two following options:

- ON - Allows only one station to be on at a time, regardless of programmed start times.

- OFF- Allows multiple stations to be on simultaneously if station start times overlap.

```
┌─────────────────────────────────────────────────┐
│ P # CYCLE MODE: START TIMES                       │
│  | F1 | =CHANGE OPTION              | ↓ |  | ↑ |  │
└─────────────────────────────────────────────────┘
```

Figure 19: Overlap Protection

Step 5   Irrigation Program

An Irrigation Program is defined as a watering program responding to rain shutdown features and Flow Max control.

The IRRIGATION PROGRAM: YES option sets a program to respond to rain shutdown and features such as stop watering.

The IRRIGATION PROGRAM: NO option disables commands associated with rain shutdown or stop watering. This option is primarily used for controlling lighting, security gates, water fountains, etc.

Note: *Selecting IRRIGATION PROGRAM: YES does not place the program into the Rain Shutdown mode. Refer to "Rain Off" page to place the controller into Rain Shutdown.*

Warning: **Irrigation programs should be set to the Yes option for any watering configuration.**

Press the Down Arrow to display the Irrigation Program option screen, and select the appropriate option.

```
P # IRRIGATION PROGRAM: YES
 | F1 | =CHANGE OPTION          | ↓ |  | ↑ |
```

Figure 20: Irrigation Program

Step 6   **Omit By Date Enable**

OMIT BY DATE allows you to enter up to 15 dates, on which watering will NOT occur. The steps required to add/delete dates are detailed in the Omit By Date section. The Omit By Date option determines whether or not a program will run for the omitted dates entered into the controller.

There are two options:

- ON - Enables omitting by date (Program will not start on any omitted date).

- OFF- Disables omitting by date (Program start will not be affected by Omit By Date entries).

Press the Down Arrow to display the Omit By Date Enable option screen.

Press F1=CHANGE OPTION to select the appropriate option.

```
P # OMIT BY DATE ENABLE OPTION:  OFF
 | F1 | =CHANGE OPTION              | ↓ |  | ↑ |
```

Figure 21: Omit By Date Option

Step 7   Station Delay Time

Use STATION DELAY TIME to specify "dead" time between stations being controlled by a program. For example, assume a program controls three stations and there is a station delay time of 10 seconds. After station 1 has completed its watering, the controller will wait 10 seconds before turning on station 2. When station 2 completes, the controller will delay another 10 seconds before starting station 3.

The available delay is 0 to 255 seconds.

Press the Down Arrow key to display the Station Delay Time screen.

```
P # CYCLE MODE: START TIMES
 | F1 | =CHANGE OPTION              | ↓ |  | ↑ |
```

Figure 22: Station Delay Time Display

Enter the Station Delay Time.

Step 8   **Time Format**

The time format for station run times can be established on a per program basis.

There are two options, HH:MM (hours and minutes) and MM:SS (minutes and seconds).

The MM:SS option allows precise station run time control, since the station can be programmed to the second.

Press the Down Arrow key to display the Time Format screen.

Select the Time Format using the F1=CHANGE OPTION toggle key.

```
P # TIME FORMAT OPTION: HH:MM
 | F1 | =CHANGE OPTION          | ↓ | | ↑ |
```

Figure 23: Time Format

Step 9   **At Water Limit**

There are two options.

- Select GIVE WARNING to continue watering when the monthly water limit is reached. If the limit is exceeded, an entry is made in the Warning/Report list and irrigation continues (see Chapter 10).

- Select STOP WATERING to cease watering when the monthly water limit is reached. If the limit is exceeded, an entry is made in the Warning/Report list and irrigation is stopped (see Chapter 10). No further irrigation occurs until a new month begins (and the monthly water total is reset).

Press the Down Arrow key to display the At Water Limit screen.

Select either Stop Watering or Give Warning using the F1=CHANGE OPTION toggle key.

```
P # AT WATER LIMIT: STOP WATERING
 | F1 | =CHANGE OPTION              | ↓ |  | ↑ |
```

Figure 24: At Water Limit

Step 10   Master Valve

There are four options:

- MV1 (Master Valve 1)

- MV2 (Master Valve 2)

- Normally Open MV

- None

Press the Down Arrow key to display the Master Valve selection screen.

```
P # MASTER VALVE USED: MV1
 | F1 | =CHANGE OPTION              | ↓ |  | ↑ |
```

Figure 25: Master Valve Selection

Advance through the four selections using the F1=CHANGE OPTION key and select the appropriate Master Valve configuration.

Note: If the NONE option is selected for Master Valve, no further Master Valve/Pump options will follow.

> *Note: If a Normally Open Master Valve is selected, it will not be activated with the program. It will be energized only if the controller detects a main line or unscheduled overflow condition. In this condition, 24 VAC appears at the N.O. terminal board output, which turns the valve off.*

Step 11   Pump

There are two options:

- Select Pump if the program is to operate with a pump.

- Select No Pump if the program is to operate without a pump.

Press the Down Arrow key to display the Pump selection screen.

Select the Pump configuration using the F1=CHANGE OPTION toggle key.

```
P # USES NO PUMP
 | F1 | =CHANGE OPTION              | ↓ |  | ↑ |
```

Figure 26: Pump Selection

Step 12   Master Valve On Between Stations

There are two options, ON and OFF.

Select the appropriate configuration.

```
MASTER VALVE IS ON BETWEEN STATIONS
 | F1 | =CHANGE OPTION            | ↓ |  | ↑ |
```

Figure 27: Valve On/Off Between Stations

Step 13 **Master Valve Delay Turn On Time**

Use MASTER VALVE DELAY TURN ON TIME to delay the activation of the master valve by 0 to 600 seconds from the program starts time (one time delay).

Press the Down Arrow key to display the Master Valve Delay Turn On Time entry screen.

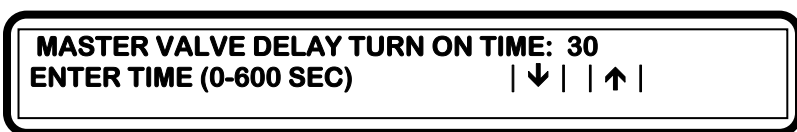Enter the delay time then press ENTER. The time must be between 0 and 600 seconds.

```
 MASTER VALVE DELAY TURN ON TIME:  30
 ENTER TIME (0-600 SEC)              | ↓ |  | ↑ |
```

Figure 28: Valve Delay Turn On Time

To end the Program Setup procedure, press the Down Arrow to return to the Setup Main Menu.

To make changes or to configure another program number, press F1=PROGRAM and repeat Setup Program procedure. Advance through all menu screens using the Down Arrow.

ISC (Individual Station Control)

ISC is used to specify operational settings for the Individual Station Control (ISC) programs used by the Evolution DX2.

The ISC setup options are given below. The options are identical to those given in the previous section, Setup Programs. Refer to the Setup Programs section for details on the ISC options.

- Cycle Mode
- Overlap Protection
- Rain Shutdown
- Omit By Date
- Time Format
- Water Limit Checking
- Master Valve
- Pump
- Master Valve Delay Turn on Time

Station Number Procedure

Step 1   Advance to the ISC program number entry screen
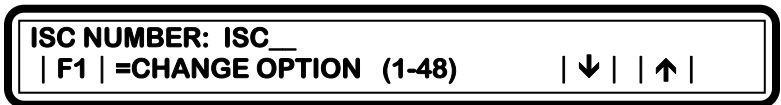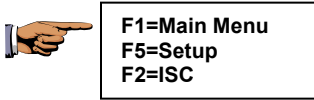   through the following sequence:

```
F1=Main Menu
F5=Setup
F2=ISC
```

```
ISC NUMBER:  ISC__
 | F1 | =CHANGE OPTION  (1-48)        | ↓ |  | ↑ |
```

**Figure 29: ISC Program Number**

Step 2   Enter the station number then press ENTER. The
               station number must be between 1 and 48.

> *Note:*   *The maximum number of stations is determined by
>   the total stations installed in the controller. The
>   maximum number will appear on the Station
>   Number Entry Display screen.*

Step 3   The ISC Options are identical to the Setup Program
               options. Refer to the Setup Program procedure to
               complete all ISC options.

               This completes the ISC procedure.

               Press the QUIT key to return to the base menu.

F1 Main Menu
F5 Setup
F3
          Stations
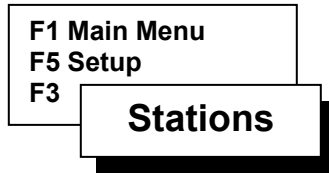
Stations

Setup Stations is used to enable/disable flow and current limit checking and to specify operational controls for the programs used by Evolution DX2.

Flow checking is used to determine if a pipe has failed (broken, clogged) or if the monthly watering limit (budget) has been exceeded. Current checking is used to determine if there is a short or break in field wiring or if an out-of-tolerance or marginal field wiring problem exists. See Appendix A for complete details on flow limit checking and Appendix B for details on current limit checking. The following station options are:

- Limit Checking - Enables or disables upper and lower limits of both Water Flow and Current.

- Limits/Type - Enter upper and lower limits of Flow and Current. Select Type as Normal or Injector. Injector type is defined as a fertilizer application station.

- Auto Limits - Establishes upper and lower limits of Flow and Current by measuring each station. An upper and lower percentage of the measurements

are calculated to automatically set
the limits for each station.

Stations Setup

Enable/Disable Limit Checking Procedure

Step 1   Advance to the Limits Option Menu through the
following sequence:

> **F1=Main Menu**
> **F5=Setup**
> **F2=ISC**

Flow and Current Limit Checking is enabled or
disabled with this option.

> | F1 | =ENABLE/DISABLE LIMIT CHECKING
> | F2 | =LIMITS/TYPE | F3 | =AUTO LIMITS | ↑ |

Figure 30: Station Limits Options

Step 2   Select F1=Enable/Disable Limit Checking.

> | F1 | =FLOW | F2 | =CURRENT
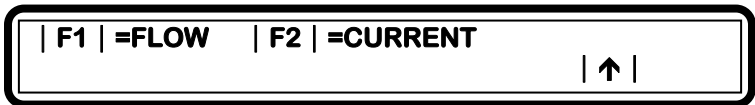> | | ↑ |

Figure 31: Flow/Current Selection

There are two options:

- Select FLOW to enable or disable water flow
  limit checking.

- Select CURRENT to enable or disable electrical
  current limit checking.

Step 3 Select F1=FLOW.

There are two options:

- Select UPPER LIMIT to enable or disable Upper Limit Flow Checking.

- Select LOWER LIMIT to enable or disable Lower Limit Flow Checking.

Step 4 Select F1=UPPER LIMIT.

```
UPPER LIMIT CHECK: ENABLED
 | F1 | =CHANGE OPTION              | ↑ |
```

Figure 32: Upper Limit Check

There are two options:

- ENABLED
- DISABLED

Step 5 Change the option displayed using the F1=CHANGE OPTION toggle key.

Step 6 Press the Up Arrow key to return to the Limit Selection screen and select F2=LOWER LIMIT.

```
LOWER LIMIT CHECK: ENABLED
 | F1 | =CHANGE OPTION              | ↑ |
```

Figure 33: Lower Limit Check

There are two options:

- ENABLED
- DISABLED

Step 7   Change the option displayed using the
                  F1=CHANGE OPTION toggle key.

If Electrical Current (enable/disable options) requires
modification, use the Up Arrow key to select the previous
screen.

Repeat the Limit Checking procedure for Current Limits options
by selecting Current rather than Flow.

At the end of Limit Checking procedure, press the QUIT key to
return to the base screen.

Limits/Type Procedure

This procedure applies to either the Station Number outputs or
the Master Valve/Pump outputs. Either parameter may be
configured at any time independently of each other.

The Station/Master Valve Number Entry screen is a dual purpose
menu which accepts two separate entries. The Station Number
output is selected by entering any number between 1 and 48
(maximum number is limited by the number of stations
installed).

The Master Valve/Pump output configuration is selected by any
number between 1 and 4 which is preceded by a 0 (zero). The
Master Valve/Pump selections are:

- MV1=01
- MV2=02
- N.O.=03
- Pump=04

> *Note: Entries from 05 to 09 will be accepted as station
> number outputs.*

Step 1   Advance to the Station Number/Master Valve Entry
              screen through the following sequence:

> **F1=Main Menu**
> **F5=Setup**
> **F3=Stations**
> **F2=Limits/Type**

> **STATION NUMBER:**
> **ENTER STATION NUMBER (1-48, OX=MV) | ↑ |**

Figure 34: Limits/Type

> *Note:*   *The Station Numbers relate to the individual station*
>   *outputs whereas the Master Valve selection relates*
>   *to the complete irrigation system configuration.*
>   *These entries should be considered as two*
>   *independent parameters.*

Step 2   Enter the station number then press ENTER. The
              Number must be between 1 and 48.

> *Note:*   *The maximum number of stations is determined by*
>   *the total stations installed in the associated satellite*
>   *controller. The maximum number will appear on*
>   *the Station Number Entry Display screen.*

Step 3   Select F1=CURRENT LIMIT from the three options
              in the following display:

```
| F1 | =CURRENT LIMIT    | F2 | =FLOW LIMIT
| F3 | =TYPE                              | ↑ |
```

Figure 35: Limit Options

The three options are:

- CURRENT LIMIT - Set up limits for electrical current checking.

- FLOW LIMIT- Set up limits for flow checking.

- TYPE - Select station type (NORMAL, or INJECTOR).

Step 4   Enter the maximum current limit for the station. The limit must be between 0.0 and 1.0 amp, and then press ENTER.

`

```
STATION ## MAX CURRENT LIMIT:  1.00
ENTER LIMIT  (0.0-1.0 AMPS)              | ↑ |
```

Figure 36: Max Current Limit

Step 5   Enter the minimum current limit for the station in the Minimum Current display screen. The limit must be between 0.0 and 1.0 amp, and then press enter.

> *Note:*   *A nominal value of 0.05 amps of quiescent current is recommended for the Minimum Current entry to ensure that an open output circuit would be detected.*

```
┌─────────────────────────────────────────────────┐
│ STATION ## MIN CURRENT LIMIT: .05               │
│ ENTER LIMIT (0.0-1.0 AMPS)              | ↑ |   │
└─────────────────────────────────────────────────┘
```

Figure 37: Min Current Limit

Controller returns to the limit options display.

Step 6   Select F2=FLOW LIMIT from the three option menu.

Enter the maximum flow limit for the station. The limit must be between 0 and 2000 gallons per minute (GPM). Press ENTER.

Controller returns to the Limit Options display

```
┌─────────────────────────────────────────────────┐
│ STATION ## MAX FLOW LIMIT:  500                 │
│ ENTER MAX LIMIT (0-2000)               | ↑ |    │
└─────────────────────────────────────────────────┘
```

Figure 38: Max Flow Limit

Step 7   Enter the minimum flow limit for the station. The limit must be between 0 and 2000 gallons per minute (GPM), then press ENTER.

```
┌─────────────────────────────────────────────────┐
│ STATION ## MIN FLOW LIMIT:                      │
│ ENTER MIN LIMIT (0-2000)                        │
└─────────────────────────────────────────────────┘
```

Figure 39: Min Flow Limit

Controller returns to the Limit Options display.

Step 8   Select F3=TYPE. The present setting for the station is displayed.

```
┌──────────────────────────────────────────────┐
│ STATION # TYPE: NORMAL                        │
│  | F1 | =NORMAL   | F2 | =INJECTOR      | ↑ | │
└──────────────────────────────────────────────┘
```
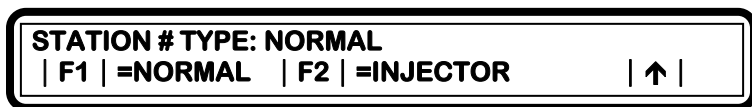
Figure 40: Station Type

There are two options:

- NORMAL
- INJECTOR

Step 9   Select F1=NORMAL to change station type to Normal.

Select F2=INJECTOR to change station type to Injector.

Step 10   Press the Up Arrow to return to the Station/Master Valve Number menu. Repeat as necessary.

End of Limits/Type procedure.

Press QUIT to return to the base screen.

Note: ***Injector Station Operation***

      The typical use of an injector station is to apply fertilizer to wet ground.

      When the user includes an injector assigned station in one or more programs, the controller will prompt for an injector delay time. The operation of a program using the injector delay time is best described with an example.

      Assume Program 1 uses injector station 10 with a programmed injector delay = 1 minute. Also assume program 1 has three NORMAL stations (1, 2, 3) each with a run time of 5 minutes.

Example: Injector station operation with a program start time of 7:00 A.M.

7:00 AM	Master Valve	ON
	Station 1	ON
7:01	Station 10	ON
7:05	Station 1	OFF
	Station 2	ON
7:10	Station 2	OFF
	Station 3	ON
7:15	All Stations and MV	OFF

Main Flow Procedure

This procedure establishes the maximum flow limit for the complete controller irrigation system. The accepted flow limit range is 0-2000 gallons per minute (GPM). The GPM value is determined by the user by calculating the expected amount of water usage at any given time in the watering configuration. A safety margin of 20% above the determined value is recommended.

Calculation Example:

For an irrigation system that delivers a maximum flow of 1000 GPM at any given time throughout the complete watering program, the Main Flow Limit would be 1200 GPM. $(1000 + 20\%) = (1000+(1000 \text{x} .20=200) = 1200)$

Flow Max Main Line Limits

In a Flow Max system, the total GPM of all participating controllers is calculated into the overall Main Flow Limit value. The Main Flow Limit is entered at the submaster controller only. For any number of controllers within a Flow Max group, there will only be one main flow limit. Remember that the main flow limit must be higher than an expected flow under normal operation yet low enough to react when a main break occurs.

Procedure

Step 1   Advance to the Station Number/Master Valve Entry
screen through the following sequence:

```
F1=Main Menu
F5=Setup
F3=Stations
F2=Limits/Type
```

```
STATION NUMBER:
ENTER STATION NUMBER (1-48, OX=MV)        | ↑ |
```

Figure 41: Main Flow Limit Entry

Step 2   Enter 01 (zero 1) then press ENTER. The main limit
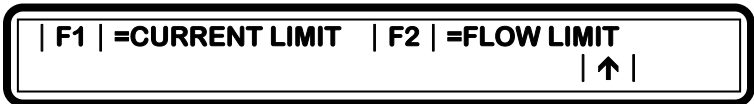option menu is depicted in Figure 4-26:

```
| F1 | =CURRENT LIMIT    | F2 | =FLOW LIMIT
                                       | ↑ |
```

Figure 42: Main Limit Options

Step 3   Select F2=FLOW LIMIT. The maximum main flow
limit is displayed (the default value is 2000 GPM).

```
MAIN FLOW    MAX FLOW LIMIT:   2000
ENTER MAX LIMIT (0-2000)                 | ↑ |
```

Figure 43: Main Flow Maximum Limit

Step 4   Enter the determined value for your system and then
press the ENTER key. Press QUIT to return to the
base screen.

              This completes the Main Flow Limit procedure.

Auto Limits Procedure

The Auto Limits feature establishes upper and lower limits of Flow and Current by constantly measuring each station. An upper and lower percentage of the measurements are calculated to automatically set the limits for each station.

The current upper default percentage is set at 20% above the measured value (If the measured value is .50 Amps, the calculated value for the upper limit would be .60 Amps). The lower default percentage is set at 50% below the measured value (If the measured value is .50 Amps, the calculated value for the lower limit would be .25 Amps).

The default values may be changed at any time using the F2=SET LIMIT (%) option. The percentage value ranges are given on the percentage entry display screen.

> *Note:*   *If the default values are not suitable for your application, the SET LIMITS percentages must be entered prior to running the Auto Limits. Select F2=SET LIMIT and set your percentages accordingly.*

Step 1   Advance to the Limits/Type menu Auto Limits two options are displayed through the following key sequence:


```
F1=Main Menu
F5=Setup
F3=Stations
F2=Limits/Type
```

```
| F1 | =RUN AUTO LIMITS    | F2 | =SET LIMIT (%)
                                    | ↑ |
```

Figure 44: Auto Limits

Step 2   Select F1=RUN AUTO LIMITS and verify the following three option display:

```
| F1 | =FLOW ONLY   | F2 | =CURRENT ONLY
| F3 | =BOTH FLOW AND CURRENT          | ↑ |
```

Figure 45: Auto Limits

There are three options:

- Flow Only
- Current Only
- Both Flow and Current

Step 3   Select F1=Flow Only and enter the station number. The station number must be between 1 and 48. To measure all stations, enter station number 1, and then press ENTER.

Note: *The maximum number of stations is determined by the total stations installed in the controller. The maximum number (1-xx) will appear on the Station Number Entry Display.*
Each station will run for the full time period of the flow check delay time (1 to 6 minutes) before proceeding to the next station.

The following display, as depicted in Figure 4-30, indicates the station number, run time count-down timer, station current measurement (I) and flow measurement (GPM). The upper and lower limits of flow are automatically calculated based on these measured parameters.

When the count-down timer is zero, the station number will increment to the next station and the measurement process is repeated. When all stations are complete, the display returns to the three option selection screen. At this point, all upper and lower percentage values have been calculated.

> *Note:* **The default measuring time for each station is two minutes. This time period accounts for the Flow Delay time allowing water flow pressure to stabilize.**
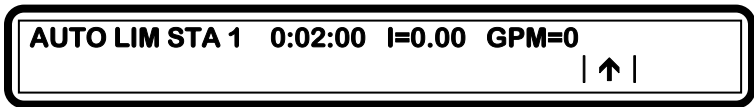
AUTO LIM STA 1   0:02:00   I=0.00   GPM=0
| ↑ |

Figure 46: Auto Limits

Step 4   Select F2=CURRENT ONLY and enter the station number. The station number must be between 1- 48. To measure all stations, enter station number 1, and then press ENTER.

The Current measuring default time is 5 seconds for each station. The calculating program is identical to the Flow mode. In addition to sequencing through all stations, MV1, MV2 and the N.O. output currents are also established.

> *Note:*   **The pump is not calculated and therefore should be established by the user manually.**

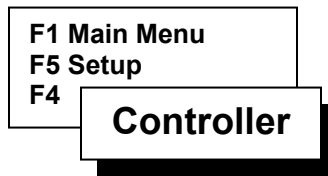When completed, the Auto Limits Options menu will be displayed.

Step 5   Repeat procedure selecting F3=BOTH FLOW AND CURRENT.

Thia selection is identical to the previous steps with the Current measurements taking place on the first pass through the stations and the Flow measurements are taken on the second pass.

When the flow measurement pass is completed, the Auto Limits Options will be displayed.

This completes the Auto Limits procedure.

Press QUIT key to return to the base screen.

```
┌─────────────────────────┐
│ F1 Main Menu            │
│ F5 Setup                │
│ F4  ┌────────────────────────┐
└─────┤                        │
      │   Controller           │
      │                        │
      └────────────────────────┘
```

Setup Controller

Setup Controller is used to specify operational controls for the
controller. The following options are available in the Controller
Setup:

- FLOW OPTIONS - Set monthly limits, select
  meters for flow checking, specify
  the amount of time to delay
  before checking limits, and set
  unscheduled flow limits. See
  Appendix A for complete details
  on flow meter operation.

- OMIT BY DATE - Select up to 15 dates, on which
  watering will not occur.

- USER OPTIONS - Change the time and date, select
  the language for the display, and
  enter or change access codes
  (passwords) for using the
  controller. See Appendix E for
  additional details on access
  codes.

- CONFIGURATION - Specify communications
  mode of the satellite, submaster
  or the Flow Max group.

Flow Options Procedure

Step 1   Advance to the Controller Flow Options menu
through the following sequence:
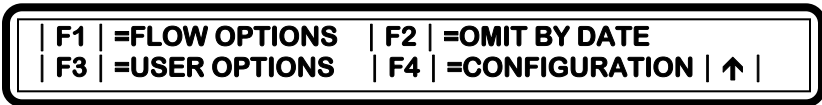
```
F1=Main Menu
F5=Setup
F4=Controller
```

```
| F1 | =FLOW OPTIONS   | F2 | =OMIT BY DATE
| F3 | =USER OPTIONS   | F4 | =CONFIGURATION | ↑ |
```

Figure 47: Controller Options

Step 2   Select F1=Flow Options to display the following
Limit options:

```
| F1 | =MONTHLY LIMIT  | F2 | =COMPARE LIMITS
| F3 | =DELAY LIMIT    | F4 | =UNSCHED LIMIT  | ↑ |
```
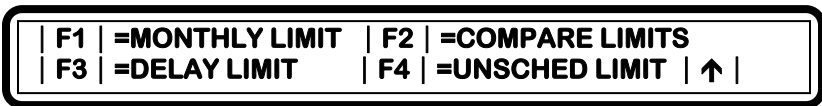
Figure 48: Limit Options

Four options are displayed:

- MONTHLY LIMIT

- COMPARE LIMITS

- DELAY LIMIT

- UNSCHED LIMIT

Step 3   To change monthly water limit, select
F1=MONTHLY LIMIT.

The current monthly water limit of the controller is
displayed.

CONTROLLER MONTHLY WATER LIMIT: NONE
ENTER LIMIT (1-9999999)   F1=NONE | ↑ |

Figure 49: Monthly Water Limit

> *Note: If the monthly watering limit is reached, the*
> *controller can be programmed to either:*
> *1. Give Warning*
> *2. Stop Watering*
> *See "At Water Limit"*

Step 4   Enter the limit, or press F1=NONE to enter no limit.
The limit must be between 1 and 9999999.

> *Note: Water units are specified in gallons.*

Press the Up Arrow to return to the Limit Options
screen.

Step 5   Flow Meter Compare Limit Selection

Select F2=COMPARE LIMITS. The flow meter
currently being used is displayed.

```
┌─────────────────────────────────────────┐
│ FLOW METER USED:   FLOW #1                │
│  | F1 | =CHANGE OPTION          | ↑ |     │
└─────────────────────────────────────────┘
```
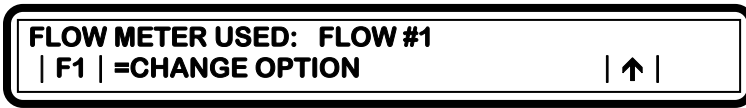
Figure 50: Flow Meter Selection

There are three options:

- FLOW METER #1- Station flow rate limit checking will use data provided by FLOW METER #1. Accumulated water totals by FLOW METER #1 are used for comparison to the Monthly Water Limit specified in the previous step.

- FLOW METER #2 - Operation is identical to Flow Meter #1. Accumulated water totals by FLOW METER #2 are compared to the specified Monthly Water Limit.

- SUM OF FLOW #1 + FLOW #2 - Selecting sum of both meters indicates that the controller will take the accumulation total of FLOW METER #1 and add it to the accumulation total of FLOW METER #2. The result will be compared to the Monthly Water Limit. Additionally, station flow rates (measured in GPM) will also be summed and compared.

Step 6   Select the appropriate option using the F1=CHANGE OPTION key.

Press the Up Arrow key to return to the Limit Options display.

Step 7   Delay Limit

The Delay Limit sets a delay time (in minutes) prior to taking measurements to allow for stabilization of water lines.

Select F3=DELAY LIMIT from the Limit Options display.

```
┌─────────────────────────────────────────┐
│ DELAY TIME: 3                            │
│ ENTER TIME (1-6 MIN)              | ↑ |  │
└─────────────────────────────────────────┘
```
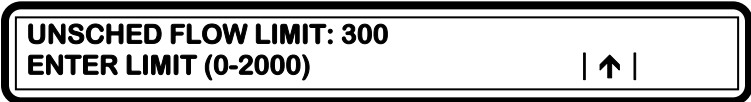
Figure 51: Delay Limit Time

Step 8   Enter the delay time. The delay must be a value between 1 and 6 minutes. Press ENTER to return to Limit Options screen.

Step 9   Unscheduled Limit

The Unsched Limit option sets the maximum unscheduled water flow which can occur before an alarm or shut-down occurs.

Select F4=UNSCHED LIMIT to display the following screen:

```
┌─────────────────────────────────────────┐
│ UNSCHED FLOW LIMIT: 300                  │
│ ENTER LIMIT (0-2000)              | ↑ |  │
└─────────────────────────────────────────┘
```

Figure 52: Unsched Flow Limit

Step 10   Enter the Unscheduled Limit value. The limit must be between 0 and 2000 gallons then press ENTER.

This completes the Flow Options procedure.

Press the QUIT key to return to base menu.

Omit By Date Procedure

Step 1   Advance to the Controller Omit By Date Options
menu through the following sequence:

F1=Main Menu
F5=Setup
F4=Controller
F2=Omit By Date

OMISSION DATES (MONTH/DAY): NONE
| F1 | =DELETE | F2 | =ADD | ↓ | | ↑ |

Figure 53: Omission Dates

The date entered last is displayed. All prior dates may be viewed
by pressing the Down Arrow key.

Step 2   **Deleting dates**

Using the arrow keys to display the date to be
deleted, then press the F1=DELETE key. Repeat
procedure as necessary.

Step 3   **Adding Dates**

Press the F2=ADD key. Enter the number of the
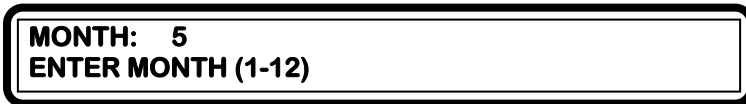month. Use 1 for January, 2 for February, etc., and
then press ENTER.

MONTH: 5
ENTER MONTH (1-12)

Figure 54: Month Entry

Step 4   Enter the day of the month. The day must be
                  between 1 and 31, and then press ENTER.

```
┌─────────────────────────────────────────────┐
│ DAY OF THE MONTH:   15                        │
│ ENTER DAY OF THE MONTH (1-31)                 │
└─────────────────────────────────────────────┘
```

Figure 55: Day of the Month

Step 5   Repeat the F2=ADD DATE sequence to add
                  additional dates, up to 15 dates may be entered.

Step 6   To review entered dates, use the Up Arrow key.

                  This completes the Omit By Date procedure.

                  Press QUIT to return to base screen.

User Options Procedure

The three available User Options are:

- Time/Date

- Language

- Access Code

Step 1   Advance to the User Options menu through the
                  following sequence:

> **F1=Main Menu**
> **F5=Setup**
> **F4=Controller**
> **F3=User Options**

```
┌─────────────────────────────────────────────┐
│ | F1 | =TIME/DATE     | F2 | =LANGUAGE        │
│ | F3 | =ACCESS CODE                    | ↑ |  │
└─────────────────────────────────────────────┘
```

Figure 56: User Options

Step 2   **Time/Date**

Select F1=TIME/DATE to display the two following options:

- 12 HOUR display

- 24 HOUR display

```
| F1 | =12 HOUR (AM/PM) TIME DISPLAY
| F2 | =24 HOUR TIME DISPLAY              | ↑ |
```
Figure 57: Time Format

Step 3   Press F1 to select 12 Hour (AM/PM) Time Display, or F2 to select 24 hour time display.

Step 4   Enter the current time in hours and minutes.

If 12 hour format was selected, press the F1=AM/PM toggle key to select AM or PM.

If you selected 24 hour format, 1 PM is 13:00, 2 PM is 14:00, etc.
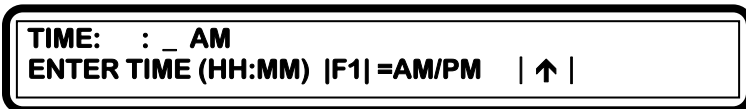
```
TIME:    : _  AM
ENTER TIME (HH:MM)  |F1| =AM/PM    | ↑ |
```
Figure 58: Time Entry Format

Step 5   Press ENTER to advance to the Year Entry screen.

Enter the year. Four digits must be entered
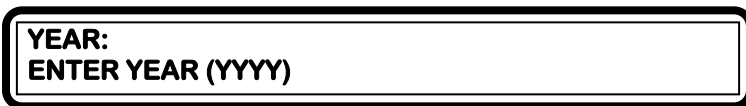
```
YEAR:
ENTER YEAR (YYYY)
```

Figure 59: Year Entry Format

Step 6   Press ENTER to advance to the Month Entry screen.

Enter the month. Use 1 for January, 2 for February, etc.

```
MONTH:
ENTER MONTH (1-12)                          | ↑ |
```

Figure 60: Month Entry Format

Step 7   Press ENTER to advance to the Day of the Month Entry screen.

Enter the day of the month. The day must be between 1 and 31.

```
DAY OF THE MONTH:
ENTER DAY OF THE MONTH (1 – 31)          | ↑ |
```

Figure 61: Date of the Month Entry

Step 8   Press ENTER to display the two Date Format options.

```
| F1 | =MONTH / DAY / YEAR DISPLAY
| F2 | =DAY / MONTH / YEAR DISPLAY        | ↑ |
```

Figure 62: Date Format Options

Step 9   Press F1 to select Month/Day/Year display, or press F2 to select Day/Month/Year display.

```
| F1 | =MONTH / DAY / YEAR DISPLAY
| F2 | =DAY / MONTH / YEAR DISPLAY          | ↑ |
```

Figure 63: Date Format Options

The selection advances the display to the Day Entry screen.

Step 10   Enter the present day of the week using keypad numbers 1 through 7 (SUN-SAT).

```
DAY:
ENTER DAY OF THE WEEK |SUN| - |SAT|       | ↑ |
```

Figure 64: Day of Week Entry Format

Pressing ENTER returns to the User Options display.

Step 11   Language

Select F2=LANGUAGE to display the two following options:

- English - Displays all menus in English

- Espanol - Displays all menus in Spanish

```
| F1 | =TIME/DATE    | F2 |=LANGUAGE
| F3 | =ACCESS CODE                        | ↑ |
```
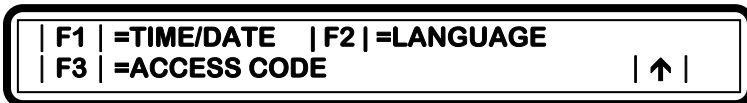
Figure 65: User Options

Step 12   Select the appropriate Language option. Either
                selection will return screen to the menu options.

Step 13   **Access Code**

                Select F3=ACCESS CODE.

                Access Codes are used to restrict unauthorized
                access to the controller's sensitive program data.
                Please refer to Appendix D for additional details on
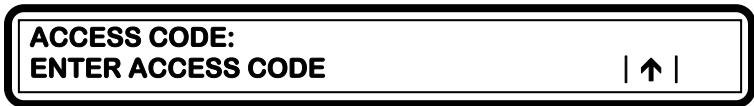   setting and using an access code.

```
ACCESS CODE:
ENTER ACCESS CODE                          | ↑ |
```

Figure 66: Access Code

Step 14   Enter the new access code. The access code must be
                three digits (numbers).

> *Note:*   *The first time an access code is entered, any three*
> *digits may be used. Thereafter, the access code you*
> *enter is checked against the code stored in the*
> *controller. The code you enter must match the*
> *stored code, or access is denied to certain menu*
> *options, as shown in the table in Appendix D.*

Caution: Do not forget your access code.

Step 15   **Access Enable/Disable**

                If the access code is correct, it is accepted and three
                options are displayed.

```
| F1 | =ENABLE/DISABLE ACCESS
| F2 | =CHANGE LEVEL   | F3 | =CHANGE CODE   | ↑ |
```

Figure 67: Access Code

- Use ENABLE/DISABLE ACCESS to turn on and off the use of the access code feature.

- Use CHANGE LEVEL to change the access code level.

- Use CHANGE CODE to enter a new access code.

Step 16   Select F1=Enable/Disable Access.

```
| F1 | =RESTRICT ACCESS
| F2 | =NO RESTRICTIONS              | ↑ |
```

Figure 68: Access Restriction

There are two options:

- Select RESTRICT ACCESS by using the access code to control use of the controller.

- Select NO RESTRICTIONS to not use the access code.

Step 17   Press F1 to select RESTRICT ACCESS or press F2 to select NO RESTRICTIONS.
The previous menu is then displayed.

Step 18   **Access Code Level**

Select F2=CHANGE LEVEL to advance to the Select Level screen.

```
┌─────────────────────────────────────────────┐
│ SELECT ACCESS LEVEL                           │
│  | F1 | =LEVEL 1      | F2 | =LEVEL 2      | ↑ |│
└─────────────────────────────────────────────┘
```

Figure 69: Select Access Level

There are two options:

- LEVEL 1

- LEVEL 2

Step 19   Press F1 to select Level 1 or press F2 to select Level 2. The previous menu is then displayed.

Step 20   **Access Code**

Select F3=CHANGE CODE and enter the new access
code. The code must be three digits.

```
┌─────────────────────────────────────────────┐
│ ACCESS CODE:                                  │
│ ENTER ACCESS CODE                         | ↑ |│
└─────────────────────────────────────────────┘
```
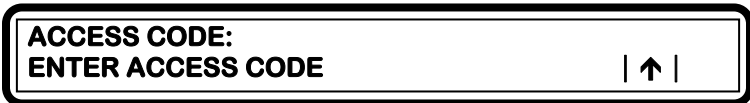
Figure 70: Select Access Level

Step 21   Press the Up Arrow to return to the previous menu. Repeat as necessary.

This completes the User Options procedure.

Press QUIT key to return to base menu.

Configuration Procedure

The Configuration Options allow a controller to be set up to operate as a submaster or satellite and with or without Flow Max, in a Central Control System.

For Flow Max operation, refer to Flow Max Appendix E. This appendix describes Flow Max in detail with full procedures on setting up a Flow Max system.

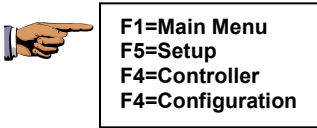**Step 1**   Advance to the Configuration Options menu through the following sequence:

> **F1=Main Menu**
> **F5=Setup**
> **F4=Controller**
> **F4=Configuration**

| F1 | =ACTS AS SATELLITE
| F2 | =ACTS AS SUBMASTER | F3 | =FLOW MAX | ↑ |

Figure 71: Configuration Options

There are three options:

- Select F1=ACTS AS SATELLITE if:

  The controller operates in stand-alone mode or the controller operates in Central Control Mode, but is not a submaster.

- Select F2=ACTS AS SUBMASTER if:

  o The controller is to operate as a submaster (A submaster controller has direct communications with a Rain Master Central Control System via radio, telephone or direct wiring).

  o A submaster is also required in a self-contained Flow Max configuration performing as the management controller over the system.

- Select F3=FLOW MAX if:

  This controller is part of a Flow Max setup.
  See Appendix F for full details on Flow Max.

Note: **These option configurations will be required on all controllers in a Flow Max system. The controllers must be assigned as satellites with the first controller as the submaster. Participating units will need to be set up for sharing the flow sensor, master valve or pump.**

Step 2 Select F1=ACTS AS SATELLITE. When selected, the base screen is displayed.

The controller is now assigned as a satellite.

Step 3 From the Configuration Options menu, select F2= ACT AS SUBMASTER. The following communication screen is displayed:

```
SUBMASTER COMMUNICATIONS TYPE: RF / WIRE
 | F1 | =RADIO/WIRE | F2 | =PHONE | F3 | =TRUNK | ↑ |
```

Figure 72: Submaster Communication

There are three options:
- Radio Wire
- Phone
- Trunk

Select the appropriate communication option, for your system.

Step 4 Enter the submaster address in the following screen:
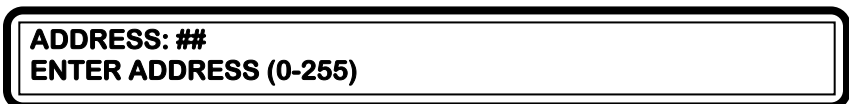
```
ADDRESS: ##
ENTER ADDRESS (0-255)
```

Figure 73: Submaster Address

> If the submaster is hardwired to one or more satellites, these satellites will be automatically assigned addresses immediately after connecting to the hardwire link.

Step 5   From the Configuration Options menu, select F3= FLOW MAX. The following Flow, Pump and Master Valve selection screen is displayed:
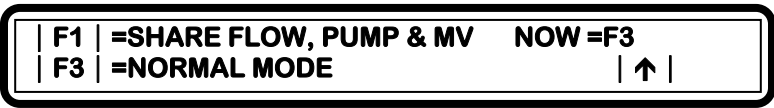
```
| F1 | =SHARE FLOW, PUMP & MV     NOW =F3
| F3 | =NORMAL MODE                      | ↑ |
```

Figure 74: Shared Devices

> There are two options:
> - Share Flow, Pump, and MV
> - Normal Mode
>
> If no devices are shared, select F3=NORMAL MODE.
>
> In a Flow Max system, shared devices must be selected in the Submaster and all participating controllers.
>
> Refer to Flow Max Appendix E for full configuration procedures.

This completes the Configuration procedure.

Press the QUIT key to return to the base screen.

```
F1 Main Menu
F5 Setup
F5    Sensors
```
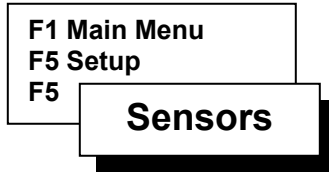
Sensors

Setup Sensors is used to prepare the controller for use of flow
sensors. See Appendix A for details on flow sensors.

Moisture Procedure

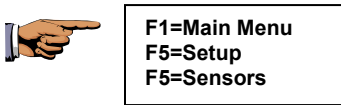**Step 1**   Proceed to the Sensor Option Selection menu as
follows:

```
F1=Main Menu
F5=Setup
F5=Sensors
```

```
| F1 | =MOISTURE    | F2 | =FLOW
                                    | ↑ |
```

Figure 75: Sensor Options

Step 2   Select F1=MOISTURE to display the following
options:

```
| F1 | =REVIEW M SENSORS  | F2 | =SETUP ALL MS
| F3 | =SETUP ONE MS   | F4 | =ENABLE/DIS MS | ↑ |
```

Figure 76: Sensors Setup

> *Note: Moisture sensors are no longer supported by the
> Evolution DX2 Controller.*

Press the QUIT key to return to the base menu.

Flow Procedure

Step 1   Proceed to the Sensor Option Selection menu as follows:
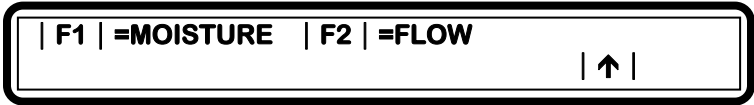


```
F1=Main Menu
F5=Setup
F5=Sensors
```

| F1 | =MOISTURE | F2 | =FLOW
                                              | ↑ |

Figure 77: Sensor Options

Step 2   Select F2=FLOW. The following menu is displayed:

| F1 | =FLOW METER 1
| F2 | =FLOW METER 2 | ↑ |
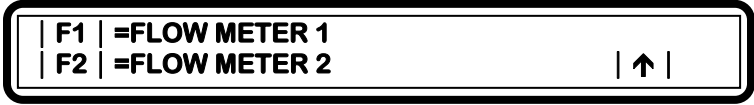
Figure 78: Flow Meter Selection

There are two options:

- FLOW METER 1
- FLOW METER 2

Step 3   Select F1=FLOW METER 1.

There are two options:

- SET K VALUE
- SET OFFSET VALUE

The K and offset values provide the calibration data required for the controller to compensate for supply line pipe size and flow meter used. Use SET K VALUE to enter the K value.

Refer to Appendix A to select the proper K value for your installation. Use SET OFFSET VALUE to enter the OFFSET value. Refer to Appendix A to select the proper OFFSET value for your installation.

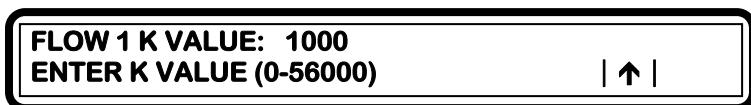**Step 4**   Select F1=SET K VALUE. The current K Value is displayed.

```
FLOW 1 K VALUE:   1000
ENTER K VALUE (0-56000)              | ↑ |
```

Figure 79: K Value Entry

Step 5   Enter the K Value. The value must be between 0 and 56000. Press ENTER.

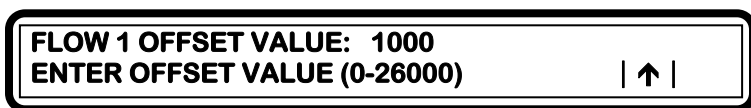**Step 6**   Select F2=SET OFFSET VALUE. The current Offset Value is displayed.

```
FLOW 1 OFFSET VALUE:   1000
ENTER OFFSET VALUE (0-26000)         | ↑ |
```

Figure 80: Offset Value Entry

Step 7   Enter the Offset Value. The value must be between 0 and 26000. Press ENTER.

Step 8   Press the Up Arrow to return to the Flow Meter selection screen. Select F2=FLOW METER 2.

Repeat the procedure as described for Flow Meter 2.

> *Note:*   ***Weather Center installation requires that the K and
> Offset values be set to zero (default values) on Flow
> Meter 2. K=0, Offset=0***

This completes the Flow procedure.

Press QUIT key to return to the base menu.