



Smart Irrigation
From the Ground Up

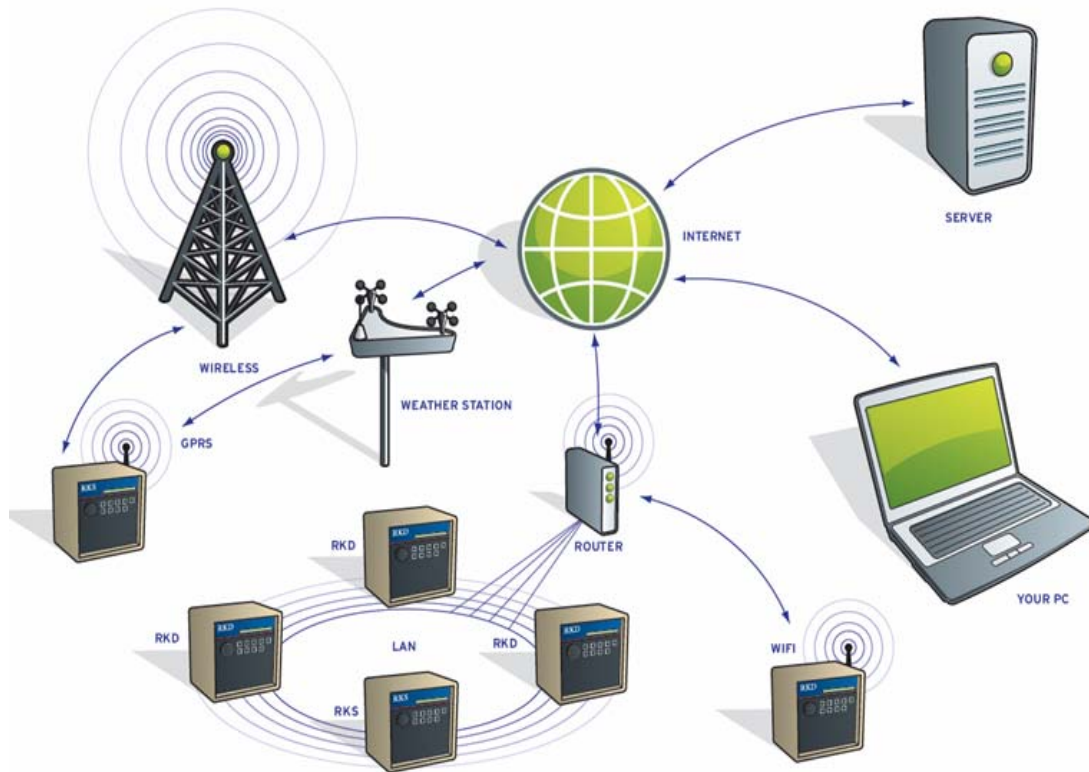
Tucor RealNet Data Access

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www.tucor.com

You can remotely manage your Tucor RKD and RKS controllers from just about any computer that has a web browser. Whether you're at a friend's house, in a library, or sitting in your truck with a laptop, monitoring the controllers you're responsible for becomes a simple task. You can turn valves on, change programs, verify flow rates, view alarms... it's like standing in front of the controller from a hundred miles away. All in real-time.

Access to your controller is through the internet. The RKD and RKS may be managed by accessing our server-based web application, "Cycle Manager", using any existing java-based¹ web browser, such as Internet Explorer or Firefox, on any computer platform, such as Windows, Mac, and Linux.

REALNET



¹ Java is a free, secure, widely-used scripting language supported by Sun Microsystems.

Connection Options

Tucor's server must connect to the RKD/RKS over the internet. That connection *at the controller* may be made in one of two ways:

- Your own LAN (wired or WIFI) [Local Service Provider]
- AT&T's existing national cellular GPRS network [Global Service Provider]

The actual hardware used consists of any combination of four possibilities:

Using Your Local Service Provider

1. **LAN**

Use the Tucor LAN-100 serial-to-Ethernet device server. The input connects to your network with a CAT-5 cable, the output connects to the controller.

2. **Wireless LAN**

Use the Tucor WLAN-100 wireless 802.11b/g serial-to-Ethernet device server. This plugs into the controller and connects wirelessly to your network (like your laptop at Starbucks).

3. **Wireless Network Mesh Radio**

Access multiple Tucor RKD/RKS controllers wirelessly by creating your own wireless Ethernet or RF infrastructure with a WNR, using the Tucor WNR-100 wireless mesh radios. Then connect the WNR to your Internet portal (like an ISP) to access the devices from Cycle Manager.

Note that LAN, WIFI, and WNR require accessing and configuring your own network and router. A static external IP address is also required. If this is not suitable due to ISP or IT security restrictions, the WIN-100 is an alternative.

Using Tucor's Global Service Provider (AT&T)

4. **WIN**

The WIN-100 uses a wireless cellular network connection to AT&T's internet backbone. No local area network is necessary. It is easily installed, configuration is minimal, and AT&T's cell coverage is widespread.

General plan pricing

Connecting with your existing LAN network (LAN, WLAN, WNR) uses your current broadband internet connection, so usually you won't have additional internet access costs. The GPRS (WIN-100) relies on cellular network data, so there will be access costs. With both the LAN and GPRS there will be a one-time account activation fee, along with a yearly server access fee. Fees are determined by your local Tucor distributor.

Software

The Tucor Cycle Manager is a web application designed to support Tucor's "Total Cycle Management" concept of irrigation scheduling. Total Cycle Management integrates Tucor controllers with ET devices and Soil Moisture Sensors, all accessible with our RealNet service, ensuring timely access to accurate irrigation.

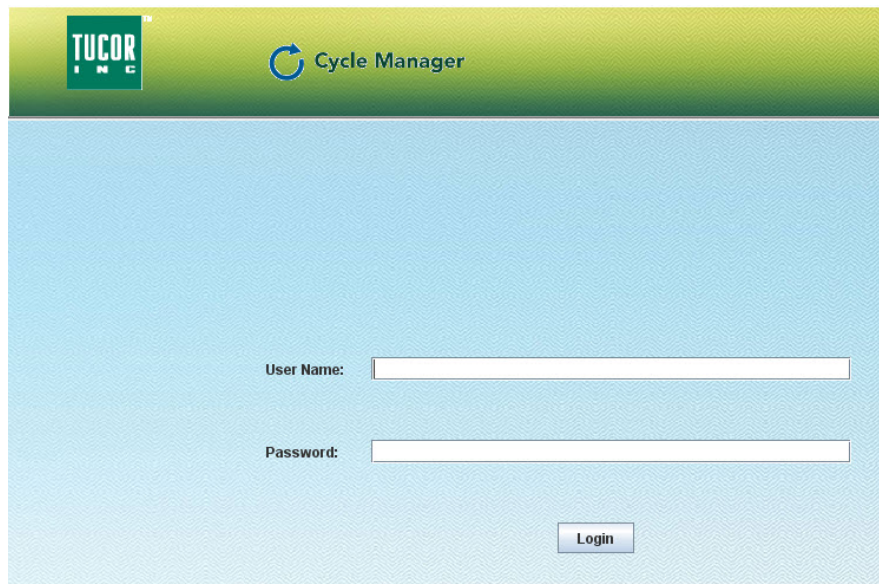
With Cycle Manager you'll have remote access to

- Programs (10 available)
- Individual Stations (up to 100)
- Sensor setup (Rain, etc.)
- Flow rates and alarms (when using a flow sensor)
- ET data (when using a suitable ET input)
- Monitoring data

Most importantly, the controller's data is stored on the server ("web"), so should some catastrophe or unwanted changes occur, you can easily return to the controller's original system state. Printouts of the system can provide you with hard-copy data. Extensive monitoring information confirms water savings and usage to the pertinent authorities. Alarms can be sent by email, notifying you of undesirable situations, which can be verified on-line and often resolved through RealNet, without anyone even having to visit the site.

The following screen shots give a brief overview of the power and flexibility of RealNet and Total Cycle Manager.

Going to Tucor's Cycle Manager web page prompts you for a logon and password.



The screenshot shows the login interface for Tucor's Cycle Manager. At the top, there is a green header bar containing the Tucor logo on the left and the text "Cycle Manager" on the right. Below the header, the main content area has a light blue background with a subtle, repeating pattern. In the center of this area, there are two input fields: "User Name:" followed by a white text box, and "Password:" followed by another white text box. Below the password field, there is a small, rectangular button labeled "Login".

After logon, a list is shown of the controllers registered to your logon name.

				Select device
Site	Type	Number	Address	
156 : Area A	RKD	001724000017	166.131.240.167	
157 : Area B	RKD	001724000018	166.131.240.168	
158 : Area C	RKD	001724000019	166.131.240.169	
159 : Area G	RKD	001724000020	166.131.240.170	
184 : Area G North	RKD	0017247000746	166.131.240.187	
185 : Area G South	RKD	0017240000753	166.131.240.188	

Choosing one of those devices brings you to the **Dashboard**, the top-level menu for managing your controller. At this point you can see

1. The connection and synchronization status. You'll immediately be aware if any changes have been made on either the controller or web. You can revert or accept them.
2. The current system Mode. Clicking on the Mode allows you to change it.²
3. List of any running Programs and Stations, with the option to pause or turn them off.
4. Option to manually start Programs and Stations.
5. Status of Alarms.
6. Status of flow, ET, Line condition, etc.
7. Sync button, time of day, Print button, Revert and Save data options.

The screenshot shows the RealNet Dashboard interface. At the top, the 'Cycle Manager' section includes a 'Connected Synchronized' status indicator (1) and a mode selector knob set to 'AUTO' (2). The left sidebar contains navigation icons for Dashboard, Programs, Stations, Sensors, Flows, IntelliSet, Monitoring, Information, Miscellaneous Settings, and Directory. The main content area features several data tables: 'Running Stations' (3) showing active programs and stations, 'MANUAL STARTS' (4) for selecting stations and programs, 'ALARMS' (5) listing various system alerts, and a 'FLOW' table (6) displaying water flow metrics. At the bottom, a status bar (7) shows 'Time left: 11:44', the current time '8:24:13 AM', and buttons for 'Print' and 'REVERT'.

RealNet Dashboard (Main Screen)

² Supported in current "round knob" style of controllers.

Programs shows you

1. Tabs for up to ten individual Programs. Program 4 shown here.
2. Select status of Program.
3. Set water budget percent, or adjust run length via ET input.
4. Water days, 14 day or Odd/Even scheduling.
5. Start times, up to 12 unique, with cycling.
6. Booster pump assignment.
7. Stations running within the Program and duration of each in hh:mm:ss. Note that the Stations can run in durations of seconds.

The screenshot displays the 'Programs' configuration window. At the top, there are tabs for Pgm #1 through Pgm #10, with Pgm #4 selected. Below the tabs, there are several configuration sections:

- ACTIVE/PASSIVE:** Radio buttons for 'Active' (selected) and 'Passive'.
- WATER BUDGET:** A slider set to 100% and a checkbox for 'ET' (checked).
- Water Days:** Radio buttons for 'Odd', 'Even', and '14 Days' (selected). Below are checkboxes for days of the week: Wednesday, Thursday, Friday, Saturday, Sunday, Monday, Tuesday.
- Start Times:** A table with columns for Start, Cycles, and End. Start #1 is set to 4:30 AM with 2 cycles and ends at 8:31 AM.
- RUN TIMES:** A table with columns for Station, Run Time, and Note. Station 3, 5, 8, and 9 have run times of 00:05:00.
- Booster:** Radio buttons for 'None' (selected), 'Booster 1', and 'Booster 2'.

 A 'RealNet Connection Overview' window is overlaid on the bottom of the configuration area.

Program Display

Stations shows you

1. Station name and sequence. Stations can be sequenced in any order.
2. Expected flows.
3. Status pass/fail.
4. Description field for helpful information.

The screenshot displays the 'Stations' configuration window. On the left is a sidebar with navigation icons for Dashboard, Programs, Stations, and Sensors. The main area shows a table with the following data:

Seq	Name	Exp. Flow	OK	Failed	Description
1	ST1	0	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2	ST2	0	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
3	ST3	0	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
4	ST4	37	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
5	ST5	34	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
6	ST6	23	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
7	ST7	25	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
8	ST8	34	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
9	ST9	34	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
10	ST10	11	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
11	ST11	25	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
12	ST12	23	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

Stations Display

Sensors allows you to set up

1. Rain.
2. ET.
3. Alarm.
4. Flow.

1 Rain

- Rain Disabled
- Rain Rain Contact (N/O)
- Rain Rain Contact (N/C)
- Rain Rain Device (Pulses) Ratio can be set using the IntellisET tab.

2 ET

- ET Disabled
- ET ET enabled (N/O)
- ET ET enabled (N/C)
- ET ET device (Pulses) Calibration is set on the IntellisET tab.

3 Alarm/Flow

- Alarm/Flow Disabled
- Alarm/Flow Alarm (N/O)
- Alarm/Flow Alarm (N/C)
- Alarm/Flow Flow (Pulses) Set Details Below

4 Flow Sensor Type

Flow Setup	FS-200	Adjust (%)	0	K-Factor	2.843	Offset	0.144
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Sensors Display

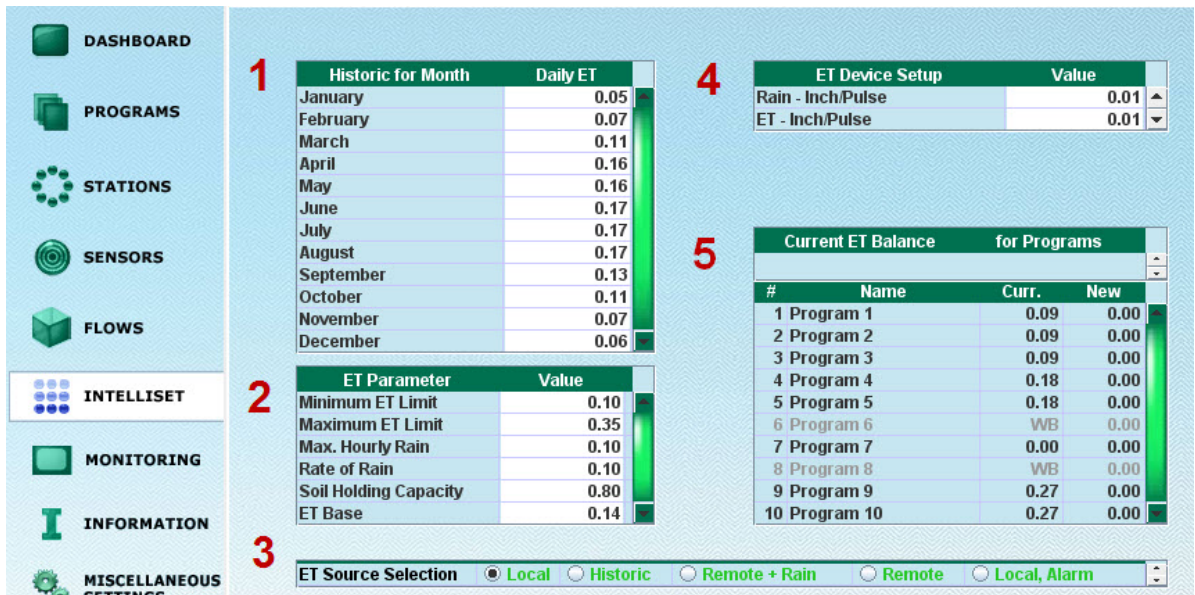
Flows allows you set FlowGuard limits and actions.

Id	Flow Settings	Threshold	TEXT:	Reaction
1	High Flow	75 GPM		
2	Flow Deviation	0 %		
3	Unscheduled Flow	17 GPM		
4	Master Pump Failure	0 GPM		<input checked="" type="radio"/> Programs <input type="radio"/> Pump/MV
Reaction Delay in Minutes (for 1 - 3 above)		3		

Flow Guard Display

Intellisets allows you to see and adjust:

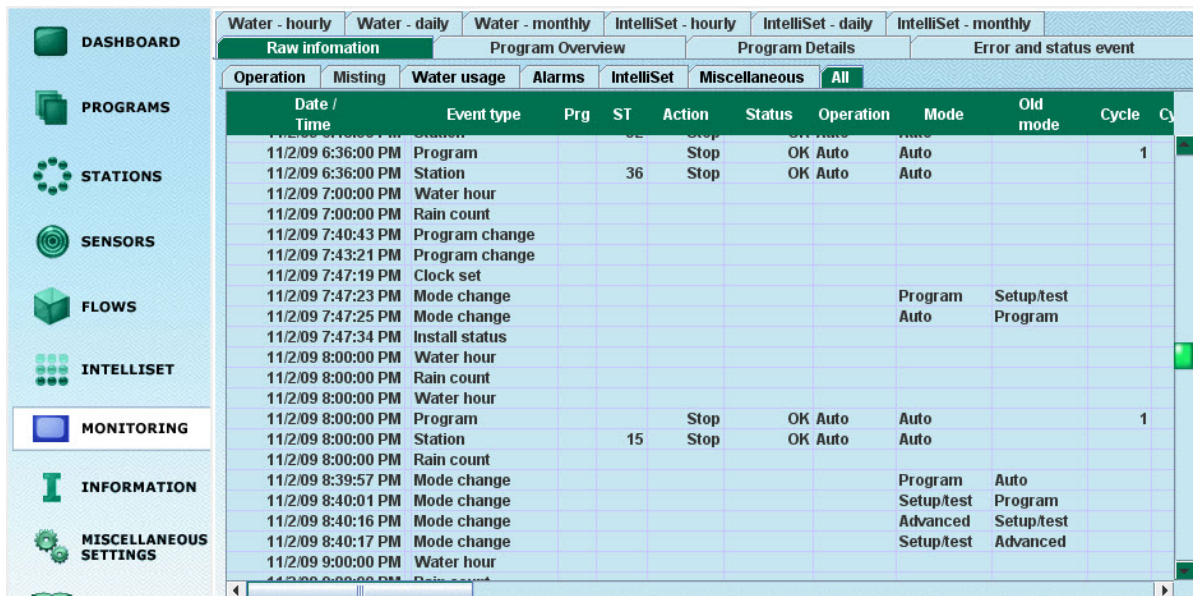
1. Historic ET (by month).
2. Various ET parameters.
3. Source of ET (local, remote, historic).
4. ET input settings.
5. Current ET balance per Program.



Intellisist Display

Monitoring shows you more data than we have room to show you here. The screen shot is the Raw information tab, All data. But data is available for

1. Water: hourly, daily, monthly.
2. Intellisist (ET): hourly, daily, monthly.
3. Programs: Overview, Details.
4. Errors.
5. Raw: Operation, Misting, Water Usage, Alarms, Intellisist (ET), and All.



Monitoring Display

Information and **Miscellaneous** display incidental system information.

Directory returns you to the web page showing all of your controllers so that you may conveniently switch to a different controller.

Synchronization: If the web data does not match the controller data a “Not synchronized” message is displayed. This will occur when you make changes via the web, or if someone has previously made changes to the controller.

Boxes are checked for those areas that have the newer data. You may either use that data or check the other side to revert to the old data. Clicking Sync will send the data to the selected side, web or controller.

Cycle Manager		Connected NOT Synchronized				
Id	Section	Web	W	Controller	Last Sync.	
11	Stations	10/6/09 9:51:00 AM	<input checked="" type="checkbox"/>	<input type="checkbox"/>	6/12/09 2:50:01 PM	10/6/09 9:51:00 AM
12	Station Sequence	10/6/09 9:51:00 AM	<input type="checkbox"/>	<input type="checkbox"/>	6/12/09 1:49:03 PM	10/6/09 9:51:00 AM
13	Power	10/6/09 9:51:01 AM	<input type="checkbox"/>	<input type="checkbox"/>	6/12/09 1:49:07 PM	10/6/09 9:51:01 AM
14	Sensors	10/6/09 9:51:03 AM	<input type="checkbox"/>	<input checked="" type="checkbox"/>	9/12/09 8:35:01 AM	10/6/09 9:51:03 AM
15	ET	10/6/09 9:51:04 AM	<input type="checkbox"/>	<input type="checkbox"/>	9/15/09 2:09:08 PM	10/6/09 9:51:04 AM
16	Flow	10/6/09 9:51:07 AM	<input type="checkbox"/>	<input type="checkbox"/>	6/12/09 1:53:41 PM	10/6/09 9:51:07 AM
17	System Parameters	10/6/09 9:52:37 AM	<input type="checkbox"/>	<input type="checkbox"/>	10/6/09 9:54:54 AM	10/6/09 9:54:59 AM
101	Program #1	10/6/09 9:51:12 AM	<input type="checkbox"/>	<input type="checkbox"/>	9/28/09 1:26:07 PM	10/6/09 9:51:12 AM
102	Program #2	10/6/09 9:51:15 AM	<input type="checkbox"/>	<input checked="" type="checkbox"/>	9/28/09 1:26:11 PM	10/6/09 9:51:15 AM
103	Program #3	10/6/09 9:51:17 AM	<input type="checkbox"/>	<input type="checkbox"/>	6/12/09 1:49:31 PM	10/6/09 9:51:17 AM
104	Program #4	10/6/09 9:51:20 AM	<input checked="" type="checkbox"/>	<input type="checkbox"/>	6/12/09 1:49:37 PM	10/6/09 9:51:20 AM
105	Program #5	10/6/09 9:51:25 AM	<input type="checkbox"/>	<input type="checkbox"/>	6/12/09 1:49:42 PM	10/6/09 9:51:25 AM
106	Program #6	10/6/09 9:51:28 AM	<input type="checkbox"/>	<input type="checkbox"/>	6/12/09 1:49:47 PM	10/6/09 9:51:28 AM
107	Program #7	10/6/09 9:51:32 AM	<input type="checkbox"/>	<input type="checkbox"/>	6/12/09 1:49:52 PM	10/6/09 9:51:32 AM
108	Program #8	11/4/09 1:55:23 PM	<input checked="" type="checkbox"/>	<input type="checkbox"/>	6/12/09 1:49:58 PM	10/6/09 9:51:35 AM
109	Program #9	10/6/09 9:51:38 AM	<input type="checkbox"/>	<input type="checkbox"/>	6/12/09 1:50:03 PM	10/6/09 9:51:38 AM
110	Program #10	10/6/09 9:51:40 AM	<input type="checkbox"/>	<input type="checkbox"/>	6/12/09 12:44:10 PM	10/6/09 9:51:40 AM

Press SYNC to do Synchronization, other Topic (on the left) to Ignore SYNC

Sync Overview

This is a brief overview showing the power and flexibility of Tucor’s Cycle Manager RealNet service. Contact your Tucor distributor or Tucor for further information and pricing.