Technical Bulletin

Bulletin No. **038**
Subject: **Evolution DX2 Controller Power Consumption**
Page 1 of 3
Product Applicability: **Evolution DX2 Controllers**
Engineering Release: **R. A. Olson**
Engineering Release Date: **November 10, 2004**
Distribution: **APPROVED FOR GENERAL RELEASE**

1.0 INTRODUCTION

This Technical Bulletin documents power consumption measurements that were made on an Evolution DX48-SPED-T controller. The controller was equipped with a DX-FLOW board, a DX-RF board, and a DX-RADIO-F. Although a 48 station transient protected controller was used for these measurements, there would be no appreciable current measurement differences if a 6 station non-transient controller were used.

2.0 METHODOLOGY

All current measurements were performed by measuring the incoming current on the 120 VAC input power side of the transformer. Current measurements were made using a Fluke Model 73 multi-meter connected in series with the 120 VAC input power line.

NOTE: **All current measurements were confirmed using a Fluke Model 75. Both meters read the same current in all test cases.**

3.0 MEASUREMENTS

The AC line voltage was measured at 123.5 VAC throughout all of the conducted tests. In addition to quiescent current measurements, measurements were also made with solenoid(s) turned on. The transmit power of the Maxon radio was not measured because this power is negligible in relation to the solenoid valve usage.

3.1 QUIESCENT CURRENT – NO VALVES ON

Measured quiescent controller current = 0.18 amperes.

This is the AC measured current when no station or Master Valve is turned on.

3910-B Royal Avenue
Simi Valley, CA 93063
Tel: (805) 527-4498
Fax: (805) 527-2813

QUIESCENT ampere–hours per day = total amperes x 24 hours
QUIESCENT ampere–hours per day = 0.18 amperes x 24 hours
QUIESCENT ampere-hours per day = 4.32 ampere-hours
(With no station or Master Valve turned on)

3.2 QUIESCENT CURRENT – ONE VALVE ON
Measured quiescent current and one solenoid on = 0.24 amperes.

This is the AC measured current when one solenoid is turned on. The solenoid current measured 0.22 amperes @ 24 VAC as observed by the built-in DX2 current meter.

ONE SOLENOID = total current – quiescent current
ONE SOLENOID = 0.24 amperes – 0.18 amperes
ONE SOLENOID = 0.06 amperes @ 123.5 VAC
(With one station or Master Valve turned on)

3.3 QUIESCENT CURRENT – TWO VALVES ON
Measured quiescent current and two solenoids on = 0.30 amperes.

This is the AC measured current when one master value and one station is turned on. The combined solenoid current measured 0.52 amperes @ 24 VAC as observed by the built-in DX2 current meter.

TWO SOLENOIDS = total current – quiescent current
TWO SOLENOIDS = 0.30 amperes - 0.18 amperes
TWO SOLENOIDS = 0.12 amperes @ 123.5 VAC
(With one station and Master Valve turned on)

NOTE: The measured value is the same as the expected value;
2 x 0.06 amperes = 0.12 amperes

4.0 CALCULATIONS

The formula for calculating the power required for an Evolution DX2 controller is:

Total Power in ampere-hours = (Quiescent ampere-hours) + ((total number of "on" solenoids x 0.06amperes) x (water window duration in hours))

4.1 CALCULATION EXAMPLE 1: Assume that you operate one solenoid at a time, with no Master Valve and the water window will have stations watering from 8PM till 4AM.

Total Power in ampere-hours = (4.32 ampere-hours) + ((1 x 0.06 amperes) x (8 hours))
Total Power in ampere-hours = (4.32 ampere-hours) + (0.48 ampere-hours)
Total Power in ampere-hours = 4.8 ampere-hours per day

4.2 CALCULATION EXAMPLE 2: Assume that you operate two solenoids at a time (one station and one Master Valve) and the water window will have stations watering from 8PM till 6AM.

3910-B Royal Avenue
Simi Valley, CA 93063
Tel: (805) 527-4498
Fax: (805) 527-2813

Total Power in ampere-hours = (4.32 ampere-hours) + ((2 x 0.06) x (10 hours))
Total Power in ampere-hours = (4.32 ampere-hours) + ((0.12) x (10 hours))
Total Power in ampere-hours = 4.32 ampere-hours + 1.2 ampere-hours
Total Power in ampere-hours = 5.52 ampere-hours per day

4.3 CALCULATION EXAMPLE 3: Assume that you operate three solenoids at a time (two stations and one Master Valve) and the water window will have stations watering from 7PM till 7AM.

Total Power in ampere-hours = (4.32 ampere-hours) + ((3 x 0.06) x (12 hours))
Total Power in ampere-hours = (4.32 ampere-hours) + ((0.18) x (12 hours))
Total Power in ampere-hours = 4.32 ampere-hours + 2.16 ampere-hours
Total Power in ampere-hours = 6.48 ampere-hours per day

5.0 CONCLUSIONS

The ampere-hours required to operate a DX2 controller with NO stations on is 4.32 ampere-hours per day. The contribution of solenoid usage over duration of time has a significant impact on this number. Calculation Example 3 above yields a 6.48 ampere-hours value.

When estimating power consumption it is important to consider worse case conditions, the worse case water window and the total number of solenoids that are expected to be turned on at any time. Use the formula provided in this document to calculate these requirements.

End of Technical Bulletin

3910-B Royal Avenue
Simi Valley, CA 93063
Tel: (805) 527-4498
Fax: (805) 527-2813