

UNITED STATES  
SECURITIES AND EXCHANGE COMMISSION  
Washington, D.C. 20549  
SCHEDULE 13G  
Under the Securities Exchange Act of 1934  
(Amendment No. \_\_\_\_\_)

\_\_\_\_\_ Infusystem Holdings Inc. \_\_\_\_\_  
(Name of Issuer)

Common Shares, Par Value .0001

\_\_\_\_\_  
(Title of Class of Securities)

\_\_\_\_\_45685K102\_\_\_\_\_  
(CUSIP Number)

with a copy to:  
Austin W. Marxe Allen B. Levithan, Esq.  
527 Madison Avenue, Suite 2600 Lowenstein Sandler PC  
New York, New York 10022 65 Livingston Avenue  
Roseland, New Jersey 07068  
(973) 597-2406

(Name, Address and Telephone Number of Person  
Authorized to Receive Notices and Communications)

December 31, 2013  
(Date of Event which Requires Filing of this Statement)

Check the appropriate box to designate the rule pursuant to which this  
Schedule is filed:

\_\_\_\_\_ Rule 13d-1(b)  
 Rule 13d-1(c)  
\_\_\_\_\_ Rule 13d-1(d)

\*The remainder of this cover page shall be filled out for a reporting  
person's initial filing on this form with respect to the subject class of  
securities, and for any subsequent amendment containing information which  
would alter disclosures provided in a prior cover page.

The information required on the remainder of this cover page shall not be  
deemed to be ?filed? for the purpose of Section 18 of the Securities  
Exchange Act of 1934 (?Act?) or otherwise subject to the liabilities of that  
section of the Act but shall be subject to all other provisions of the Act  
(however, see the Notes).

Cusip No. 45685K102                      13G                      Page 2 of 6 Pages  
1. Names of Reporting Persons. I.R.S. Identification Nos. of above persons  
(entities only):

Austin W. Marxe, David M. Greenhouse and Adam C. Stettner

2. Check the Appropriate Box if a Member of a Group (See  
Instructions):

(a) [     ] Not Applicable  
(b) [     ]

3. SEC Use Only

4. Source of Funds (See Instructions): 00

5. Check if Disclosure of Legal Proceedings Is Required Pursuant to  
Items 2(d) or 2(e):

Not Applicable

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6. Citizenship or Place of Organization: United States

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Number of 7. Sole Voting Power: 0  
Shares Beneficially 8. Shared Voting Power: 1,170,602\*  
Owned by  
Each Reporting 9. Sole Dispositive Power: 0  
Person With 10. Shared Dispositive Power: 1,170,602\*\_\_

11. Aggregate Amount Beneficially Owned by Each Reporting Person:  
1,170,602\*

12. Check if the Aggregate Amount in Row (11) Excludes Certain Shares  
(See Instructions): Not Applicable

13. Percent of Class Represented by Amount in Row (11): 5.3%\*

14. Type of Reporting Person (See Instructions): IA, IN

\* This is a joint filing by Austin W. Marxe (?Marxe?), David M. Greenhouse (?Greenhouse?) and Adam C. Stettner (?Stettner?). Marxe, Greenhouse and Stettner share sole voting and investment power over 1,170,602 Common Shares own by Special Situations Life Sciences Fund, L.P. See Items 2 and 4 of this Schedule for additional information.

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Item 1. Security and Issuer:

- (a) Infusystem Holdings Inc.
- (b) 31700 Research Park Drive, Madison Heights, Michigan 48071

Item 2. (a) Name of Person Filing:

The persons filing this report are Austin W. Marxe (?Marxe?), David M. Greenhouse (?Greenhouse?) and Adam C. Stettner (?Stettner?), who are members of LS Advisers L.L.C. (?LS?), the general partner of Special Situations Life Sciences Fund, L.P. (?SSLS?). Marxe, Greenhouse and Stettner are also controlling principals of AWM Investment Company, Inc. (?AWM?), the investment adviser to SSLS. The principal business of SSLS is to invest in equity and equity-related securities and other securities of any kind or nature.

(b) Address of Principal Business Office or, if none, Residence:

The principal business address for Marxe, Greenhouse and Stettner is 527 Madison Avenue, Suite 2600, New York, NY 10022.

(c) Citizenship:

Austin W. Marxe, David M. Greenhouse and Adam C. Stettner are United States citizens.

- (d) Title of Class of Securities: Common Stock
- (e) CUSIP Number: 45685K102.

Item 3. If this statement is filed pursuant to §240.13d-1(b) or 240.13d-2(b), check whether the person filing is a: Not Applicable

- (a)  Broker or Dealer registered under section 15 of the Act;
- (b)  Bank as defined in section 3(a) (6) of the Act;
- (c)  Insurance Company as defined in section 3(a) (19) of the Act;
- (d)  Investment Company registered under section 8 of the Investment Company Act of 1940;
- (e)  An Investment Adviser in accordance with §240.13d-1(b) (I) (ii) (E);
- (f)  An employee benefit plan or endowment fund in accordance with §240.13d-1(b) (I) (ii) (F);

(g) ( ) A parent holding company or control person in accordance with §240.13d-

1(b)(1)(ii)(G);

(h) ( ) A savings association as defined in Section 3(b) of the Federal Deposit Insurance

Act;

(i) ( ) A church plan that is excluded from the definition of an investment company under section 3(c)(14) of the Investment Company Act of 1940;

(j) ( ) Group, in accordance with §240.13d-1(b)(1)(ii)(J).

Item 4. Ownership:

(a) Amount Beneficially Owned: Messrs. Marx, Greenhouse and Stettner beneficially own a total of 1,170,602 shares of Common Stock. This amount includes 1,170,602 Common Shares owned by SSL.

(b) Percent of Class: Messrs. Marx, Greenhouse and Stettner beneficially own 5.3% of the outstanding shares, of which SSL owns 5.3% of the outstanding shares.

(c) Number of Shares as to which the person has:

(i) Sole power to vote or to direct the vote: 0

(ii) Shared power to vote or to direct the vote: 1,170,602

(iii) Sole power to dispose or to direct the disposition of: 0

(iv) Shared power to dispose or to direct the disposition of:  
1,170,602

Item 5. Ownership of Five Percent or Less of a Class: If this statement is being filed to report the fact that as of the date hereof the reporting person has ceased to be the beneficial owner of more than five percent of the class of securities, check the following \_\_\_\_.

Item 6. Ownership of More than Five Percent on Behalf of Another Person: Not Applicable.

Item 7. Identification and Classification of the Subsidiary Which Acquired the Security being Reported on By the Parent Holding Company: Not Applicable.

Item 8. Identification and Classification of Members of the Group: Not

applicable

Item 9. Notices of Dissolution of Group: Not applicable.

Item 10. Certification:

By signing below I certify that, to the best of my knowledge and belief, the securities referred to above were acquired and are held in the ordinary course of business and were not acquired and are not held for the purpose of or with the effect of changing or influencing the control of the issuer of the securities and were not acquired and are not held in connection with or as a participant in any transaction having that purpose or effect.

SIGNATURE

After reasonable inquiry and to the best of my knowledge and belief, I certify that the information set forth in this statement is true, complete and correct.

Dated: February 7, 2014

/s/ Austin W. Marxe  
AUSTIN W. MARXE

/s/David M Greenhouse  
DAVID M. GREENHOUSE

/s/Adam C. Stettner  
ADAM C. STETTNER

Attention: Intentional misstatements or omissions of fact constitute Federal criminal violations (See 18 U.S.C. 1001).

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JOINT FILING AGREEMENT

Austin W. Marxe, David M. Greenhouse and Adam C. Stettner hereby agree that the Schedule 13G to which this agreement is attached is filed on behalf of each of them.

/s/\_Austin W. Marxe

Austin W. Marx

/s/\_David M. Greenhouse  
David M. Greenhouse

/s/ Adam C. Stettner  
Adam C. Stettner  
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