

File E251412  
Project 07CA38322

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REPORT

On

PROGRAMMABLE CONTROLLERS

\*Moxa **Inc.**  
Taipei, Taiwan

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## DESCRIPTION

## PRODUCT COVERED:

USL, CNL - Open Type Programmable Controller Interface, **Models** VPort 351 and VPort D351, may be followed by -S or -M or blank, may be followed by -SC or blank, may be followed by additional numbers or letters.

## GENERAL:

These devices are open type Ethernet Device Switch with communication interface and intended for use in industrial applications. They are microcomputer-based and communicate via interfaces through wire.

## ELECTRICAL RATINGS:

Rated Supply Voltage and Current	12 - 32 V dc, Maximum 9 W, 18 - 30 V ac, 50/60Hz, Maximum 6 W, Class 2
Maximum Surrounding Air Temperature	75°C

Relay Output: 24 V dc, 1 A, Resistance.

## NOMENCLATURE:

The **Models VPort 351 and VPort D351** series are designated as follows:

\*

VPort 351 - M - SC - T  
I            II     III   IV

I.     Series Name  
       VPort 351  
       **VPort D351**

II.    Connector Mode  
       M - Multi-Mode Optical Transceiver  
       S - Single-Mode Optical Transceiver  
       Blank - Ethernet RJ45 port

III.   Fiber Connector Type  
       SC - SC Fiber connector  
       Blank - Ethernet RJ45 port

IV.    May be followed by additional numbers or letters - Does not affect  
       the construction

## ENGINEERING CONSIDERATIONS (NOT FOR UL REPRESENTATIVE'S USE):

**The product has been evaluated to the requirements of UL and the Canadian National Standard with the description on the following pages.**

USL - Indicates investigation to United States Standard for Industrial Control Equipment, UL 508, Seventeen Edition.

CNL - Indicates investigation to Canadian Standard for Process Control Equipment, CSA C22.2 No. 142-M1987, Third Edition.

## CONSTRUCTION DETAILS:

General - The product shall be constructed in accordance with the following description and accompanying photographs.

Corrosion Protection - All parts of corrosion resistant materials are painted or plated as corrosion protection.

Spacings - Spacings have been evaluated in accordance with UL 508, the Standard for Industrial Control Equipment, Seventeenth Edition, Sec. 180, in accordance with Table 180.1, and Sec. 36, in accordance with Table 36.3.

\*Markings - The devices shall be plainly marked with **Listee's** company name, or trademark, model number, electrical ratings, **relay output ratings (whenever provided)**, and date code (**the month and year, at least**).

Markings - The following marking shall be provided on a separable self-adhesive permanent label, in instruction manual or in electronic read-only digital media format, and shipped with the device.

- a. "Maximum Surrounding Air Temperature 75°C".
- b. Suitable wiring diagram to indicate the connection.
- c. **"For use in Pollution Degree 2 Environment" or similar verbiage.**
- d. **Mounting instructions.**

\*Field Wiring Terminal Markings - "Use Copper Conductors Only". Field wiring terminals shall be marked to show a range of values or a normal value of tightening torque in pound-inches per the terminal block manufacturer. This marking is able to be located adjacent to the terminal or on a wiring diagram.

Model Difference - As outlined below.

	No. of Ethernet RJ45 port	No. of Fiber port (S.M.)	No. of Fiber port (M.M.)
VPort 351(-T)	One	N/A	N/A
<b>VPort D351</b>	<b>One</b>	<b>N/A</b>	<b>N/A</b>
VPort 351-S-SC(-T)	N/A	One	N/A
VPort 351-M-SC(-T)	N/A	N/A	One

Note :        S.M. - Single-Mode Fiber  
               M.M. - Multi-Mode Fiber  
               SC - SC Fiber connector

## MODEL VPort 351-M-SC-T - FIGS. 1 THRU 3

General - FIGS. 1 thru 3 show the overall and internal views of Model VPort 351-M-SC-T. Model VPort 351-M-SC-T is considered representative of other models covered under this Report, except where variations are specifically described below.

1. Chassis - Metal, overall measures 135 by 105 by 53.6 mm high, minimum 1 mm thick. Provided with numerous square openings on the top side covering an area of 10.4 by 87.2 mm, each opening is 1.9 by 1.9 mm, and numerous square openings on the bottom side covering an area of 22.2 by 87 mm, each opening is 1.9 by 1.9 mm.
2. Printed Wiring Board - R/C (ZPMV2), rated minimum 130°C, V-1, overall dimension of approximately 121 by 94 mm, 1.6 mm thick, two pieces, see ILLS. 1 and 2 for trace layouts for models VPort 351 series, ILL. 2 for models VPort D351 series.
3. Terminal Block (P1) - R/C (XCFR2, XCFR8), Dinkle Enterprise Co., Ltd., (E102914), Cat. No. 5EHDR-06P, mating with Cat. No. 5ESDV-6P, rated 300 V, 15 A, 105°C, wire range 12-28 AWG, torque value 4.5 lb-in.
4. Terminal Block (P2) - R/C (XCFR2, XCFR8), Dinkle Enterprise Co., Ltd., (E102914), Cat. No. 5EHDR-08P, mating with Cat. No. 5ESDV-08P, rated 300 V, 15 A, 105°C, wire range 12-28 AWG, torque value 4.5 lb-in.
5. Terminal Block (P5) - R/C (XCFR2, XCFR8), Dinkle Enterprise Co., Ltd., (E102914), Cat. No. 5EHDR-05P, mating with Cat. No. 5EHDV-05P, rated 300 V, 15 A, 105°C, wire range 12-28 AWG, torque value 4.5 lb-in.
6. Thermistor (F1) - R/C (XGPU2), Tyco Electronics Corp., Raychen Circuit Protection Div., (E74889), Cat. No. RXE250 (X250), rated 2.5 A, 72 V dc.
7. Optical Isolators (U2, U4, U8 and U11) - R/C (FPQU2, FPQU8), rated minimum 3750 V ac isolation, min. 100°C.
8. Relays (U14 and U16) - R/C (NRNT2), Matsushita Electric Works Ltd., (E43149), Model TX2-3V.  
  
Alternate - Same as above, except Takamisawa Electric Co., Ltd., (E45026), Model NA-3W-K.
9. Transient Voltage Surge Suppressors (D3, D6 and D9) - R/C (QVGQ2), CSA certified, Littelfuse Concord Semiconductor Incorporation, (E230531), Model 1.5KE56CA.

## TEST RECORD NO. 2

## General:

Representative samples of Programmable Controller Interface, Models VPort D351 series, were submitted by the manufacturer for examination and test.

Test performed on Model VPort D351-M-SC was considered representative of models VPort D351 series, due to the similarity of construction.

The samples were subjected to a test program as outlined below in accordance with UL 508, Seventeen Edition were considered representative of the same tests required by Canadian Standard for Process Control Equipment, CSA C22.2 No. 142-M1987, Third Edition. The following tests were conducted at Victronic Technology Corporation, located at 4<sup>TH</sup> Fl. 130, Lane 235, Bao Chiao Road, Shin Dian City, Taipei Hsien, Taiwan and witnessed by Underwriters Laboratories Taiwan Co., Ltd., Conformity Assessment Services Engineering Staff under the UL's WTDP (Witnessed Test Data Program). Test results relate only to the items tested.

UL Standard Test	UL 508	Canadian Standard Test	CSA C22.2 No. 142-M1987
Temperature Test	Sec. 43	Temperature	Clause 6.4
Dielectric Voltage-Withstand Test	Sec. 49	Dielectric Strength	Clause 6.8

No test was considered necessary for alternate trace layouts to Models VPort 351 series, due to previous tests results conducted on the similar construction. They were found and described in the preceding section of this Report.

Based on the previous investigation, it was not necessary to conduct the tests tabulated below.

Series Submitted	Previous Tested Model	Tests	File, Volume, Section, Report Date	Test Record No.
VPort 351	VPort 351-M-SC	Temperature and Dielectric Voltage Withstand	E251412, Volume 1, Section 18, 2007-09-01	1

Note #: Rationale to waive test - Similarity to currently certified Model VPort 351-M-SC, except for minor change on trace layouts.

Test Record Summary:

The results of this investigation, including construction review and testing, indicate that the products evaluated comply with the applicable requirements in Industrial Control Equipment, UL 508, 17<sup>th</sup> edition, latest revision date July 11, 2005, and Process Control Equipment, CSA C22.2 No. 142-M1987, Third Edition, reaffirmed 2004, and therefore, such products are judged eligible to bear UL's Mark as described on the Conclusion Page of this Report. Any information and documentation involving UL Mark services are provided on behalf of Underwriters Laboratories Inc. (UL) or any authorized licensee of UL.

Test Record by:  
EDWIN CHAO  
Engineer

Reviewed by:  
ROBIN LU  
Project Engineer

File E251412  
Project 07CA38322

September 1, 2007

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Moxa Technologies Co., Ltd.  
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## GENERAL:

These devices are open type Ethernet Device Switch with communication interface and intended for use in industrial applications. They are microcomputer-based and communicate via interfaces through wire.

## ELECTRICAL RATINGS:

Rated Supply Voltage and Current	12 - 32 V dc, Maximum 9 W, 18 - 30 V ac, 50/60Hz, Maximum 6 W, Class 2
Maximum Surrounding Air Temperature	75°C

Relay Output: 24 V dc, 1 A, Resistance.

## NOMENCLATURE:

The Model VPort 351 series are designated as follows:

## NOMENCLATURE:

VPort 351 - M - SC - T  
I            II        III    IV

- I.     Series Name  
      VPort 351
  
- II.    Connector Mode  
      M - Multi-Mode Optical Transceiver  
      S - Single-Mode Optical Transceiver  
      Blank - Ethernet RJ45 port
  
- III.   Fiber Connector Type  
      SC - SC Fiber connector  
      Blank - Ethernet RJ45 port
  
- IV.    May be followed by additional numbers or letters - Does not affect  
      the construction

## ENGINEERING CONSIDERATIONS (NOT FOR UL REPRESENTATIVE'S USE):

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- a. "Maximum Surrounding Air Temperature 75°C".
- b. Suitable wiring diagram to indicate the connection.

Field Wiring Terminal Markings - "Use Copper Conductors Only, 60/75°C". Field wiring terminals shall be marked to show a range of values or a normal value of tightening torque in pound-inches per the terminal block manufacturer. This marking is able to be located adjacent to the terminal or on a wiring diagram.

Model Difference - As outlined below.

	No. of Ethernet RJ45 port	No. of Fiber port (S.M.)	No. of Fiber port (M.M.)
VPort 351(-T)	One	N/A	N/A
VPort 351-S-SC(-T)	N/A	One	N/A
VPort 351-M-SC(-T)	N/A	N/A	One

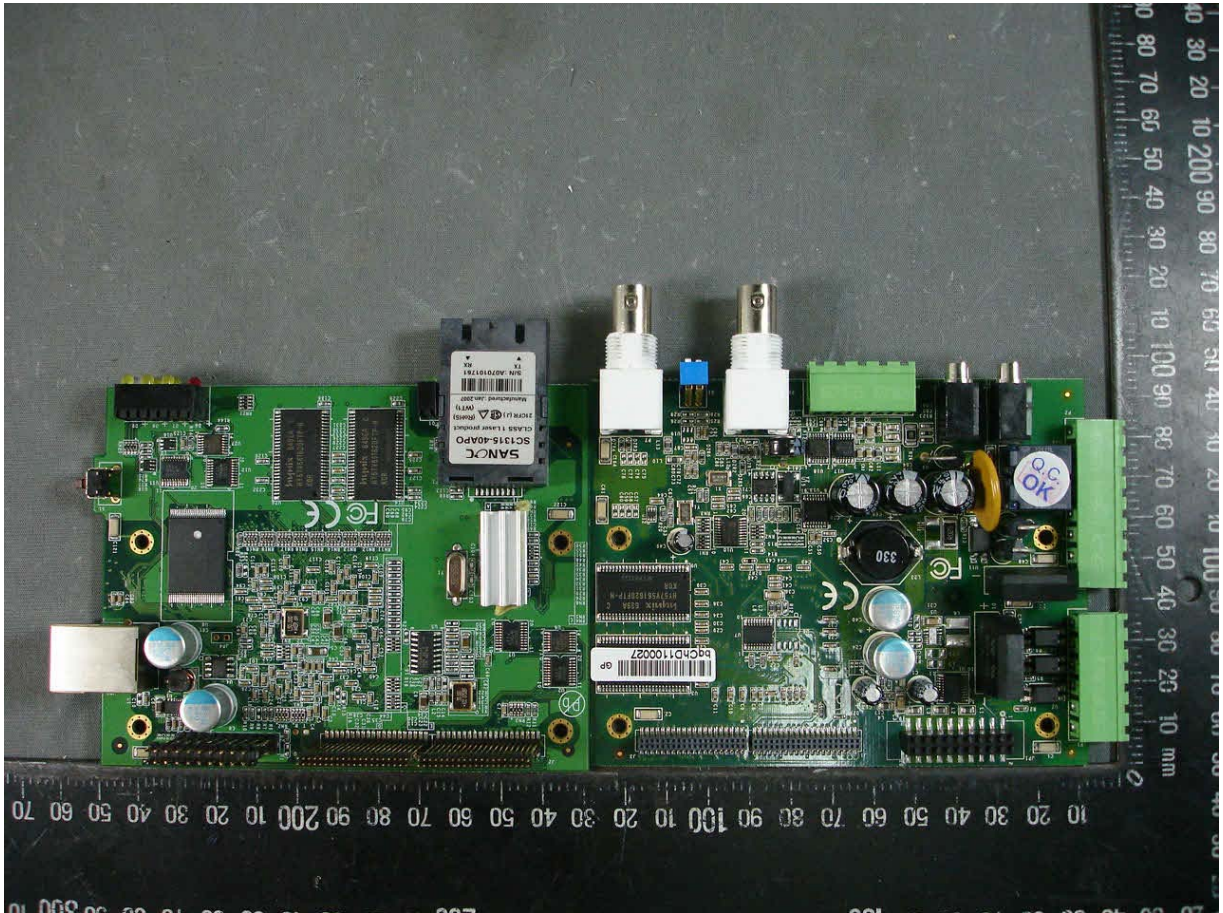
Note :  
 S.M. - Single-Mode Fiber  
 M.M. - Multi-Mode Fiber  
 SC - SC Fiber connector

## MODEL VPort 351-M-SC-T - FIGS. 1 THRU 3

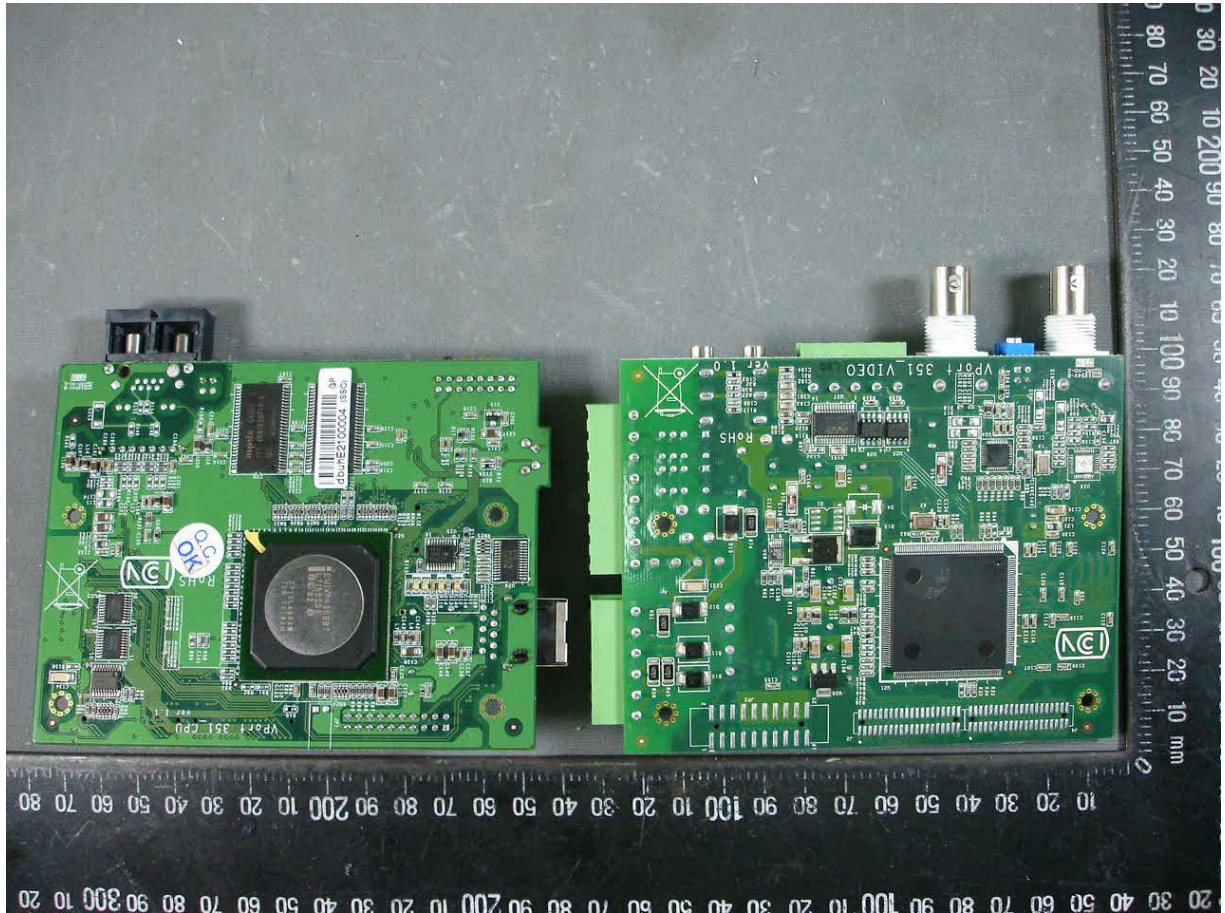
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4. Terminal Block (P2) - R/C (XCFR2, XCFR8), Dinkle Enterprise Co., Ltd., (E102914), Cat. No. 5EHDR-08P, mating with Cat. No. 5ESDV-08P, rated 300 V, 15 A, 105°C, wire range 12-28 AWG, torque value 4.5 lb-in.
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and Report



TEST RECORD NO. 1

SAMPLES:

Representative samples of Programmable Controller Interface, Models VPort 351 series, were submitted by the manufacturer for examination and test.

Test performed on Model VPort 351-M-SC was considered representative of all models covered in this Report, due to the identical of construction.

GENERAL:

Test results relate only to the items tested.

The samples were subjected to a test program as outlined below in accordance with UL 508, Seventeen Edition were considered representative of the same tests required by Canadian Standard for Process Control Equipment, CSA C22.2 No. 142-M1987, Third Edition. The following tests were conducted at Victronic Technology Corporation, located at 4<sup>TH</sup> Fl. 130, Lane 235, Bao Chiao Road, Shin Dian City, Taipei Hsien, Taiwan and witnessed by Underwriters Laboratories Taiwan Co., Ltd., Conformity Assessment Services Engineering Staff under the UL's WTDP (Witnessed Test Data Program).

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Test Record by:  
PAUL CHEN  
Project Engineer

Reviewed by:  
JOHN J. CARRIGAN  
Senior Project Engineer

SAMUEL LIAO  
Project Handler



CONCLUSION

Samples of the products covered by this Report have been found to comply with the requirements covering the category and the products are judged to be eligible for Listing and Follow-Up Service. The manufacturer is authorized to use the UL Mark on such products which comply with the Follow-Up Service Procedure and any other applicable requirements of Underwriters Laboratories Inc. Only those products which properly bear the UL Mark are considered as Listed by Underwriters Laboratories Inc. Any information and documentation involving UL Mark services are provided on behalf of Underwriters Laboratories Inc. (UL) or any authorized licensee of UL.

Test Record by:  
PAUL CHEN  
Project Engineer

Reviewed by:  
JOHN J. CARRIGAN  
Senior Project Engineer

SAMUEL LIAO  
Project Handler