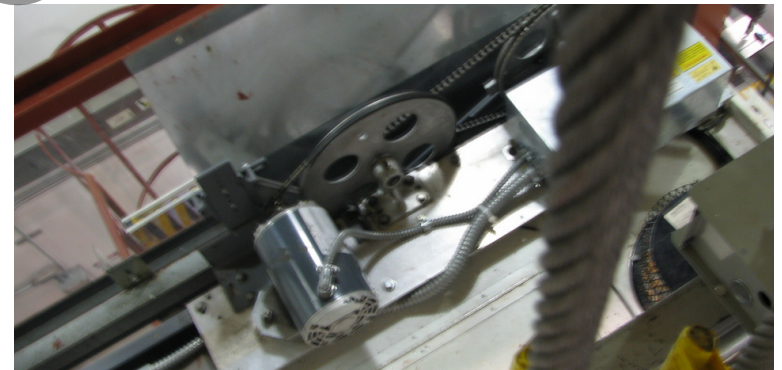
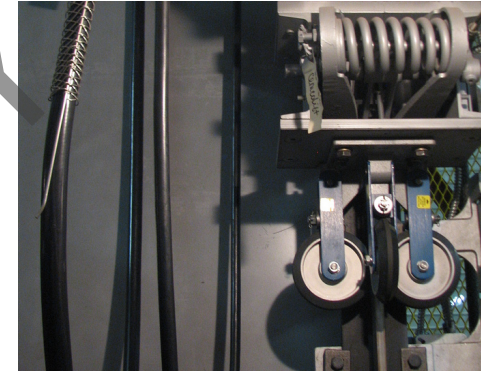


Instructor Guide



302: Advanced Electrical Printreading Module 3: International Drawings



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PREVIEW ONLY

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Icons Used In This Guide



REVIEW slides



ASK



CLASSROOM ACTIVITY



SMALL GROUP ACTIVITY



INDIVIDUAL ACTIVITY



WRITE



Multimedia



REFER participants to

Agenda

Topic #	Topic Title	Duration
1	Overview	30 Minutes
2	Standards Development	20 Minutes
3	International Technical Standards	40 Minutes
4	Common Printreading Symbols	15 Minutes
5	Applied Practice	30 Minutes
6	Summary	30 Minutes
	Total Time:	180 Minutes

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Overview

Purpose The purpose of this module is to:

Provide the participant with tools to identify international symbols used for electrical devices in escalators and elevators systems as well as to interpret these symbols in the context of wiring diagrams or schematics.

Objectives

At the end of this lesson, the transit elevator/escalator trainee will be able to:

- Compare ANSI and ISO technical standards for electronic equipment
- Identify printreading symbols common to ANSI and ISO
- Identify common device symbols on ANSI and ISO drawings
- Interpret international symbols on wiring diagrams and schematics

Materials **Mandatory**

Make sure you have the following

- PowerPoint Presentation
- Coursebook
- Quizzes
- Pencils
- Handouts: International Technical Standards, Common Printreading Symbols
- Wiring diagram or schematic with international symbols from your transit authority

Optional

You may also want the following for optional activities:



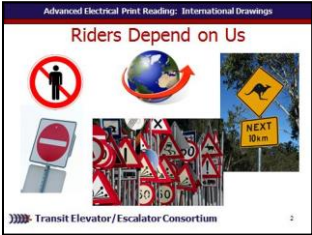
- Chalk board with chalk, large paper with marker, etc.
- Internet connection
- Lab, simulator or out of service elevator

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Module Length: 180 min Time remaining: 180 min This section: 30 min (6 slides) Section start time: _____ Section End Time: _____

DO	SAY	Materials Needed
<div> REVIEW introduction slide</div> <div><h3>Instructor's Notes</h3><div></div><div></div><div></div><div></div><div></div><div></div></div>	<p>In your own words:</p> <p>Welcome to the course on International Drawings. The purpose of this module is to provide the participant with tools to identify international symbols used for electrical devices in escalators and elevators systems as well as to interpret these symbols in the context of wiring diagrams or schematics.</p> <p>Advance ASK: Who knows what this sign is? Allow participants to answer. Advance In some other places, the same sign is shown like here. Advance In other places, you may see geographically unique signs. Advance</p>	<p>✓PPT slides 1, 2</p> <div></div> <div></div>

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Module Length: 180 min Time remaining: 180 min This section: 30 min (6 slides) Section start time: _____ Section End Time: _____

DO	SAY	Materials Needed
<div data-bbox="34 464 144 564" data-label="Image"> </div> <div data-bbox="154 499 598 542" data-label="Text"> <p>REVIEW introduction slide</p> </div> <div data-bbox="28 792 444 835" data-label="Section-Header"> <h3>Instructor's Notes</h3> </div> <div data-bbox="28 892 608 1242" data-label="Form"> <hr/><hr/><hr/><hr/><hr/> </div>	<div data-bbox="676 421 1023 464" data-label="Section-Header"> <p>In your own words:</p> </div> <div data-bbox="676 478 1391 656" data-label="Text"> <p>Wherever you go, there are signs and they can vary from place to place. You can find the same type of variety in electrical drawings from different places.</p> </div> <div data-bbox="676 664 840 699" data-label="Text"> <p>Advance</p> </div>	<div data-bbox="1497 471 1729 506" data-label="Text"> <p>✓ PPT slide 2</p> </div> <div data-bbox="1535 528 1854 763" data-label="Image"> </div>

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Module Length: 180 min Time remaining: 180 min This section: 30 min (6 slides) Section start time: _____ Section End Time: _____

DO	SAY	Materials Needed
<div> REVIEW key terms</div> <div><h3>Instructor's Notes</h3><div></div><div></div><div></div><div></div><div></div><div></div></div>	<p>In your own words:</p> <p>Lets take a look at some of the key words we will be defining as move through this module:</p> <ul style="list-style-type: none">• ANSI American National Standards Institute• CSA Canadian Standards Association• ISO International Organization of Standardization• IEC International Electrotechnical Commission• NEMA National Electrical Manufacturers Association <p>Advance</p> <ul style="list-style-type: none">• Standards Development Committees <p>Advance</p>	<p>✓PPT slides 4, 5</p> <div></div> <div></div>

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Module Length: 180 min Time remaining: 180 min This section: 30 min (6 slides) Section start time: _____ Section End Time: _____

DO	SAY	Materials Needed
<div data-bbox="34 431 139 534"></div> <div data-bbox="162 472 446 511">ASK participants</div> <div data-bbox="34 554 139 656"></div> <div data-bbox="179 592 571 624">SMALL GROUP ACTIVITY</div> <div data-bbox="34 679 139 782"></div> <div data-bbox="162 711 284 743">WRITE</div> <div data-bbox="30 792 444 835"> Instructor's Notes </div> <div data-bbox="30 896 610 1239"> <hr/><hr/><hr/><hr/><hr/><hr/> </div>	<div data-bbox="678 425 1020 464">In your own words:</div> <div data-bbox="678 486 1352 572">Thinking back to other courses or just in general, what do we already know about</div> <div data-bbox="678 592 1352 786"> <ul style="list-style-type: none"> • Drawings and symbols in escalator and elevator systems? • A logic gate? • A truth table? </div> <div data-bbox="678 863 1360 1125"> <p><i>Allow participants to think for a minute and perhaps discuss with a partner ideas as well as write down any ideas. Discuss participant responses and if possible list them on a chalk board or similar.</i></p> </div> <div data-bbox="678 1178 846 1215"> <p>Advance.</p> </div>	<div data-bbox="1499 454 1721 492">✓PPT slide 6</div> <div data-bbox="1541 529 1854 762"> </div> <div data-bbox="1512 806 1818 963"> <ul style="list-style-type: none"> ✓ Paper and pencils ✓ Chalk board or similar </div>

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Module Length: 180 min Time remaining: 150 min This section: 20 min (4 slides) Section start time: _____ Section End Time: _____

DO	SAY	Materials Needed
<div data-bbox="34 464 144 564" data-label="Image"> </div> <div data-bbox="170 492 428 528" data-label="Text"> <p>REVIEW slides</p> </div> <div data-bbox="28 792 444 835" data-label="Section-Header"> <h3>Instructor's Notes</h3> </div> <div data-bbox="28 892 608 1242" data-label="Form"> <hr/><hr/><hr/><hr/><hr/> </div>	<div data-bbox="676 428 1023 464" data-label="Section-Header"> <h4>In your own words:</h4> </div> <div data-bbox="676 492 1449 706" data-label="Text"> <p>The standards are documented after being developed in a formal, coordinated, consensus-based, and open process written by industry professionals from both the private and public sectors.</p> </div> <div data-bbox="676 714 840 749" data-label="Section-Header"> <h4>Advance</h4> </div> <div data-bbox="676 799 1400 1149" data-label="Text"> <p>With the increasing emphasis on globalization, electrical manufacturers are now looking to all parts of the world to produce, market, and sell their products. Since the electrical standards adopted by various nations may vary, the markings and symbols used to describe electrical control products can also vary.</p> </div> <div data-bbox="676 1156 869 1192" data-label="Section-Header"> <h4>Continued</h4> </div>	<div data-bbox="1497 471 1787 506" data-label="Text"> <p>✓ PPT slides 8, 9</p> </div> <div data-bbox="1535 528 1854 763" data-label="Image"> </div> <div data-bbox="1535 778 1854 1013" data-label="Image"> </div>

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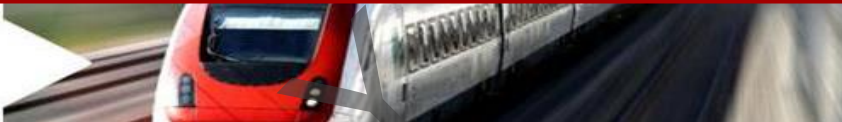


Module Length: 180 min Time remaining: 150 min This section: 20 min (4 slides) Section start time: _____ Section End Time: _____

DO	SAY	Materials Needed
<div data-bbox="34 464 144 568"></div> <div data-bbox="170 492 409 528"><p>REVIEW slide</p></div> <div data-bbox="28 792 444 835"><p>Instructor's Notes</p><hr/><hr/><hr/><hr/><hr/></div>	<p>In your own words:</p> <p>International standards development committees oversee and document the conventions for displaying information on electrical diagrams and schematics.</p> <p>Advance</p> <p>This is important for the mechanic to understand as sometimes the symbols for identical devices differ between domestic (U.S.) and international prints.</p> <p>Advance</p> <p>But they do not differ widely. This module helps the participant recognize common electrical print symbols between U.S. and international conventions for print display.</p> <p>Advance</p>	<p>✓ PPT slide 10</p> <div data-bbox="1541 531 1854 763"></div>

Elevator-Escalator – International Drawings

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Module Length: 180 min Time remaining: 130 min This section: 40 min (4 slides) Section start time: _____ Section End Time: _____

DO	SAY	Materials Needed
<div data-bbox="34 464 144 564"></div> <div data-bbox="170 492 428 528">REVIEW slides</div> <div data-bbox="34 599 144 706"></div> <div data-bbox="170 635 502 671">REFER participants</div> <div data-bbox="28 792 444 835"> <h3>Instructor's Notes</h3> <hr/><hr/><hr/><hr/><hr/> </div>	<p>In your own words:</p> <p>A good resource for the participant is a short publication, <i>A Global Reference Guide for Reading Schematic Diagrams</i> published by Allen-Bradley and available to the participant in Appendix A of this module.</p> <p>Advance</p> <p>ANSI, NEMA, CSA, and IEC are part of the International Organization for Standardization (ISO not IOS) Because 'International Organization for Standardization' would have different acronyms in different languages (IOS in English, OIN in French for <i>Organisation internationale de normalisation</i>), our founders decided to give it the short form ISO. ISO is derived from the Greek isos, meaning equal. Whatever the country, whatever the language, the short form of our name is always ISO.</p> <p>Advance</p>	<p>✓ PPT slides 12, 13</p> <div data-bbox="1541 528 1854 763"> </div> <div data-bbox="1541 778 1854 1006"> </div> <p>✓ Appendix A</p>

Elevator-Escalator – International Drawings

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Module Length: 180 min Time remaining: 130 min This section: 40 min (4 slides) Section start time: _____ Section End Time: _____

DO	SAY	Materials Needed
<div data-bbox="34 431 139 534"></div> <div data-bbox="164 472 446 511">ASK participants</div> <div data-bbox="34 554 139 662"></div> <div data-bbox="164 592 556 625">SMALL GROUP ACTIVITY</div> <div data-bbox="34 792 446 839"> <h3>Instructor's Notes</h3> <hr/> <hr/> <hr/> <hr/> <hr/> </div>	<div data-bbox="678 425 1020 464">In your own words:</div> <div data-bbox="678 489 900 528">Lets practice.</div> <div data-bbox="678 546 1360 718">Using your course book and working with someone sitting next to you, organize the following cards into groups according to their organization.</div> <div data-bbox="678 796 1412 968"> <p><i>Allow participants 5 – 10 minutes to complete. Call on various participants to lead the class through the correct answers.</i></p> <p><i>Advance</i></p> </div>	<div data-bbox="1499 458 1740 496">✓PPT slide 13</div> <div data-bbox="1541 529 1854 762"> </div> <div data-bbox="1512 808 1852 932">✓International Technical Standards cards</div>

Elevator-Escalator – International Drawings

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Module Length: 180 min Time remaining: 90 min This section: 15 min (2 slides) Section start time: _____ Section End Time: _____

DO

SAY

Materials Needed



REVIEW slides

In your own words:

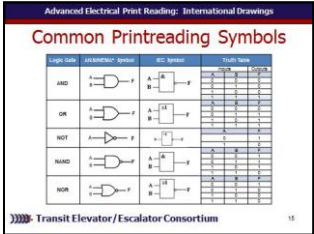
In comparing the symbols used in electrical print reading, let us look first at logic gates and truth tables. Recall from Course 203 that a digital logic gate is a circuit that transforms a special logic operation such as AND, OR, NOT, NAND, or NOR. These five basic **logic gates** are used in most electronic circuits operating on binary signals which have only two states: 1 and 0. Hence a **binary state** is either high (1) or low (0). From these logic states, **truth tables** can be constructed. A truth table typically contains several rows and columns giving a breakdown of a logic function by listing all possible values the function can attain.

Advance

Review table with participants.

Advance

✓ PPT slides 15, 16





Instructor's Notes

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Module Length: 180 min Time remaining: 75 min This section: 45 min (10 slides) Section start time: _____ Section End Time: _____

DO	SAY	Materials Needed
<div> ASK</div> <div>Instructor's Notes <hr/><hr/><hr/><hr/><hr/><hr/></div>	<p>In your own words: Name the Organization: Headquartered in Washington, DC and coordinates U.S. standards with international standards so that American products can be used worldwide.</p> <p><i>Call on participants for answer</i> <i>Advance once given the correct answer</i> Answer: American National Standards Institute (ANSI) Advance</p>	<p>✓PPT slide 22</p> <div></div>

Elevator-Escalator – International Drawings

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Module Length: 180 min Time remaining: 75 min This section: 45 min (10 slides) Section start time: _____ Section End Time: _____

DO	SAY	Materials Needed
<div data-bbox="54 464 158 564"></div> <div data-bbox="179 489 260 525">ASK</div> <div data-bbox="54 588 158 696"></div> <div data-bbox="179 618 421 696">CLASSROOM ACTIVITY</div> <div data-bbox="30 792 444 839">Instructor's Notes</div> <div data-bbox="30 896 610 1239"> <hr/><hr/><hr/><hr/><hr/> </div>	<div data-bbox="678 425 1020 468">In your own words:</div> <div data-bbox="678 518 1425 739"> <i>Using transit authority provided electrical drawings with international symbols, review the drawings and symbols with participants. Allow participants to identify international symbols.</i> </div> <div data-bbox="678 782 836 818">Advance</div>	<div data-bbox="1503 475 1744 511">✓PPT slide 26</div> <div data-bbox="1541 532 1854 763"> </div>

Elevator-Escalator – International Drawings

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Module Length: 180 min Time remaining: 30 min This section: 30 min (3 slides) Section start time: _____ Section End Time: _____

DO	SAY	Materials Needed
<div data-bbox="34 459 144 568"></div> <div data-bbox="177 488 423 568">CLASSROOM ACTIVITY</div> <div data-bbox="34 602 144 711"></div> <div data-bbox="170 631 562 668">INDIVIDUAL ACTIVITY</div> <div data-bbox="34 792 444 839"> <p>Instructor's Notes</p> <hr/><hr/><hr/><hr/><hr/> </div>	<p>In your own words:</p> <p><i>Administer quizzes.</i></p>	<ul style="list-style-type: none"> ✓ PPT slides 29 ✓ Quizzes ✓ Pencils <div data-bbox="1510 631 1823 863"> </div>