

Signal Animator

ABS MODE TRUTH TABLE

Inputs are active low. With nothing connected, they will be held at a high level and the driving circuit must connect it to ground to provide an active input. Low inputs on the table are indicated with a zero (0), high inputs with a (1), and inputs that do not matter are indicated with a blank field.

The DCA (Danger/Clear/Approach) inputs are labelled **RD**, **YL**, **GN**, **R2**, and **Y2**, and are usually driven by occupancy detectors in ABS mode. When all are inactive (high), the signal display will be dark. Display will be lit when at least one of **GN**, **RD**, or **R2** inputs are active.

The **RD** and **R2** inputs indicate Danger and when either or both are active, a stop indication will be displayed, regardless of the state of the speed inputs, or the other DCA inputs. An occupancy detector for the block the signal is guarding entry into drives either of these inputs. The second input is provided for situations where an additional occupancy detector is necessary.

The **GN** input is used for approach lighting. If approach lighting is not used, and signal is always lit, a jumper can be used to permanently connect this input to ground. For approach lighting, this input is driven by an occupancy detector that detects the block that the train is in when it reaches the signal. When approach lighting is used, signal will be dark except when the block approaching the signal is occupied (**GN** input) or when the block it is protecting is occupied (**RD** or **R2** inputs).

The **YL** and **Y2** inputs indicate Approach and when either or both are active, but not when a Danger input is active, and will result in a "something to stop" indication being displayed, with the *something* being determined by the Entry speed inputs. The second input is provided for situations where an additional occupancy detector is necessary.













EL, **EM**, **ES**, and **ER** are the Entry speed inputs, indicating Limited, Medium, Slow, and Restricting speeds respectively. Their state indicates the speed restriction for the block the signal is protecting entry to.

AL, **AM**, **AS**, and **AR** are the Approach speed restricting inputs, indicating Limited, Medium, Slow, and Restricting speeds respectively. Their state indicates what speed the next signal should be approached at.

On the following truth table, **RD** and **R2** are represented with one column labelled **R**. When the value is 1, both inputs must be 1. When the value is 0, either or both inputs are low. The same applies for **YL** and **Y2** being represented under **Y**.

Inputs													Signal Indication
AV	GN	Y	R	AL	AM	AS	AR	EL	EM	ES	ER		
	1		1										dark
Inputs GN, RD, and R2 are all inactive.													

Inputs													Signal Indication	
	AV	GN	Y	R	AL	AM	AS	AR	EL	EM	ES	ER		
"Stop" indications.				0									<p>Provides rule 436 with plate on mast</p> <p>Rule 437: Stop and Proceed</p>	
	DCA inputs: RD or R2 active.												<p>Rule 439: Stop Signal</p>	
Restricting indication.	0			1									0	<p>Low signal output used for medium head</p> <p>Rule 436: Restricting Signal</p>
	Entry speed input ER active with YL or GN input active.													
DCA inputs: GN and YL active, RD inactive. "Something to Stop" indications.	0	0	1								0	1	<p>Low signal output used for medium head</p> <p>Rule 435: Slow to Stop</p>	
	Entry speed inputs: ES active; ER <i>not</i> active.													
	0	0	1							0	1	1	<p>Provides rule 421 with plate on mast</p> <p>Rule 427: Medium to Stop</p>	
	Entry speed inputs: EM active; ES and ER <i>not</i> active.													
	0	0	1						0	1	1	1	<p>Rule 421: Limited to Stop</p>	
	Entry speed inputs: EL active; EM, ES, and ER <i>not</i> active.													
	1	0	0	1						1	1	1	1	<p>Rule 411: Clear to Stop</p>
No entry speed inputs active.														
DCA inputs: only GN active; Entry speed inputs: ES active, ER inactive. "Slow to Something" indications.	0	1	1					0			0	1	dark	
	"Slow to Restricting" indication is invalid.													
	0	1	1				0	1			0	1	<p>Rule 434: Slow to Slow</p>	
	Approach speed inputs: AS active; AR <i>not</i> active.													
	0	1	1			0	1	1			0	1	<p>Rule 433: Slow to Medium</p>	
	Approach speed inputs: AM active; AS <i>not</i> active.													
	0	1	1	0	1	1	1				0	1	<p>Rule 432: Slow to Limited</p>	
	Approach speed inputs: AL active; AM and AS <i>not</i> active.													
	0	1	1	1	1	1	1				0	1	<p>Low signal output used for medium head</p> <p>Rule 431: Slow to Clear</p>	
No Approach speed inputs active.														

Inputs													Signal Indication
	AV	GN	Y	R	AL	AM	AS	AR	EL	EM	ES	ER	
DCA inputs: only GN active; Entry speed inputs: EM active, ES and ER inactive. "Medium to Something" indications.	0	1	1	1				0		0	1	1	 <p>Provides rule 420 with  plate on mast</p> <p>Rule 426: Medium to Restricting</p>
	Approach speed inputs: AR active.												
	0	1	1	1			0	1		0	1	1	 <p>Rule 425: Medium to Slow</p>
	Approach speed inputs: AS active; AR <i>not</i> active.												
	0	1	1	1		0	1	1		0	1	1	 <p>Rule 424: Medium to Medium</p>
	Approach speed inputs: AM active; AR and AS <i>not</i> active.												
	0	1	1	0	1	1	1	1	1	0	1	1	 <p>Rule 423: Medium to Limited</p>
	Approach speed inputs: AL active; AR, AS, and AM <i>not</i> active.												
0	1	1	1	1	1	1	1	1	0	1	1	 <p>Provides rule 416 with  plate on mast</p> <p>Rule 422: Medium to Clear</p>	
No Approach speed restriction inputs are active.													
DCA inputs: only GN active; Entry speed inputs: EL active, EM, ES, and ER inactive. "Limited to Something" indications.	0	1	1	1				0	0	1	1	1	 <p>Rule 420: Limited to Restricting</p>
	Approach speed inputs: AR active.												
	0	1	1	1			0	1	0	1	1	1	 <p>Rule 419: Limited to Slow</p>
	Approach speed inputs: AS active; AR <i>not</i> active.												
	0	1	1	1		0	1	1	0	1	1	1	 <p>Rule 418: Limited to Medium</p>
	Approach speed inputs: AM active; AS and AR <i>not</i> active.												
	0	1	1	0	1	1	1	0	1	1	1	1	 <p>Rule 417: Limited to Limited</p>
	Approach speed inputs: AL active; AM, AS, and AR <i>not</i> active.												
0	1	1	1	1	1	1	1	0	1	1	1	 <p>Rule 416: Limited to Clear</p>	
No Approach speed restriction inputs are active.													

Inputs													Signal Indication	
AV	GN	Y	R	AL	AM	AS	AR	EL	EM	ES	ER			
	0	1	1				0	1	1	1	1		Rule 410: Clear to Restricting	
Approach speed inputs: AR active.														
1	0	1	1			0	1	1	1	1	1		Rule 409: Clear to Slow	
Approach speed inputs: AS active; AR not active.														
0	0	1	1			0	1	1	1	1	1		Rule 414: Advance Clear to Slow	
AV active; Approach speed inputs: AS active; AR not active.														
1	0	1	1		0	1	1	1	1	1	1		Rule 407: Clear to Medium	
Approach speed inputs: AM active; AS and AR not active.														
0	0	1	1		0	1	1	1	1	1	1		Rule 413: Advance Clear to Medium	
AV active; Approach speed inputs: AM active; AS and AR not active.														
1	0	1	1	0	1	1	1	1	1	1	1		Rule 406: Clear to Limited	
Approach speed inputs: AL active; AM, AS, and AR not active.														
0	0	1	1	0	1	1	1	1	1	1	1		Rule 412: Advance Clear to Limited	
AV active; Approach speed inputs: AL active; AM, AS, and AR not active.														
0	0	1	1	1	0	1	1	1	1	1	1		Rule 415: Advance Clear To Stop	
AV active; No Approach speed inputs active.														
	0	1	1	1	1	1	1	1	1	1	1		Rule 405: Clear Signal	
No Approach speed inputs active.														

DCA inputs: only GN active; no entry speed inputs active.
"Clear to Something" indications.

Provides rule 406 with plate on mast

- High signal output used for medium head
- Medium signal output used for low head
- High signal output used for medium head
- Medium signal output used for low head

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