



ALLEN-BRADLEY BULLETIN 1336 IMPACT SCALE FUNCTION BLOCK

APPLICATION NOTE # 1336E - 12

August 27, 1997

PURPOSE

The purpose of this document is to provide guidelines for wiring and control schemes for the Bulletin 1336 IMPACT AC Drive. This document is to be used as a suggestion only. Users must ensure that installations meet applicable codes and are suitable for the existing conditions.

The Bulletin 1336E User Manual should be used as a reference to ensure that proper wire selection, routing and fusing guidelines are followed. Refer to application note #1336E - 4 for an overview of Function Block concepts.

WHAT THIS NOTE CONTAINS

This note contains descriptions and possible uses for the Scale function block incorporated into the 1336E drive

INTENDED AUDIENCE

This application note is intended to be used by personnel familiar with the hardware components and programming procedure necessary to operate the Bulletin 1336S.


WHERE IT IS USED

The diagrams, parameter settings and auxiliary hardware used in this application note are designed to address specific issues in many different applications. Some changes by the User may be necessary to apply the concepts of this document to a specific application.

TERMS AND DEFINITIONS

[] - Indicates a parameter name

Link - A link is a software connection between two parameters that lets one parameter receive information from another.

 - This represents a **source** which is a link parameter that provides the information.

 - This represents a **destination** which is a link parameter receiving the information.

DESCRIPTION

The Scale function block is used to configure the drive with "function" inputs that perform offset, gain and clamp functions to an input value. To configure the drive with the Scale circuit the [Function Sel] parameter (212) must be programmed appropriately. Refer to figure 1.

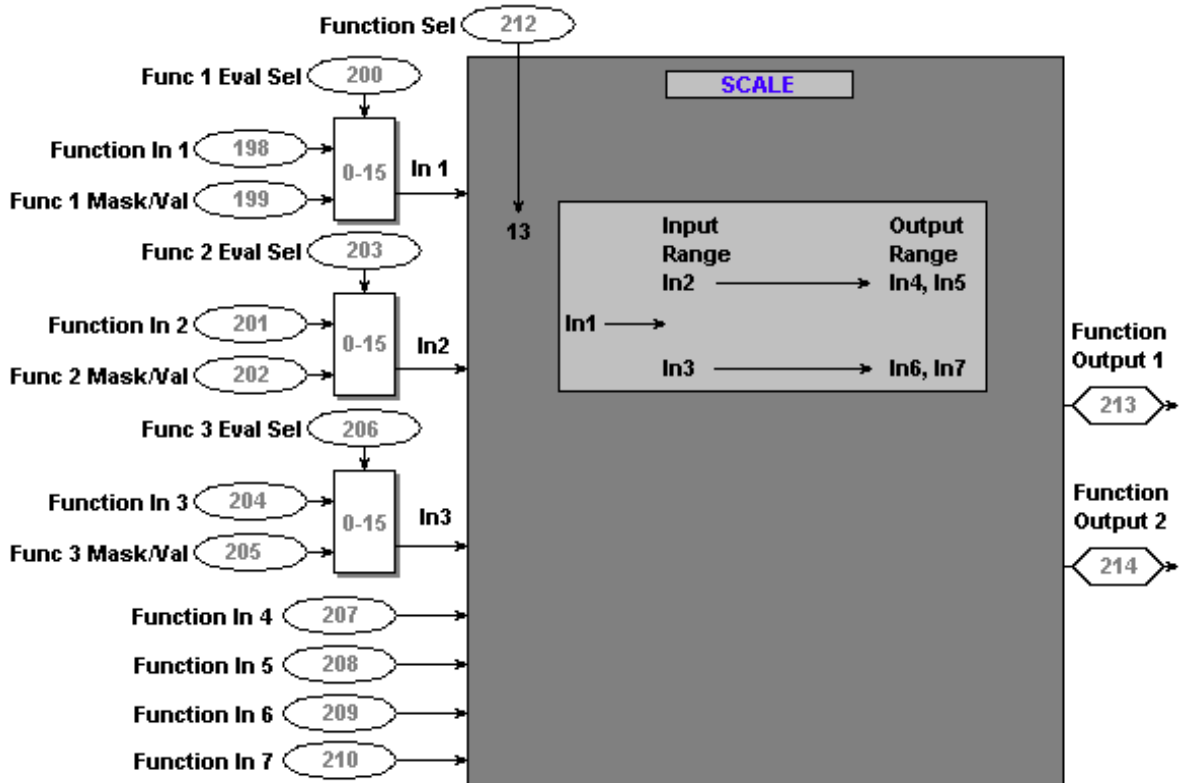


Figure 1

EVALUATING THE FUNCTION INPUTS

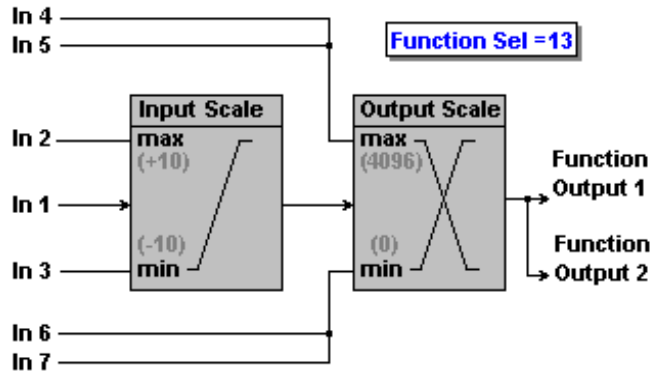
The “Function Evaluation Select” parameters (200,203,206) are used to precondition the inputs. The numbers 0-15 correspond to the 16 different evaluations available. Refer to table 1 for the descriptions.

Table 1

VALUE	EVALUATION (1 = on = true = set = closed) (0 = off = false = reset = open)
0	Pass the value directly through the function block
1	Mask the value (logical AND the input value with a value)
2	Send a true value when all bits that are set in the mask are on in the input value
3	Send a true value when all bits that are set in the mask are off in the input value
4	Send a true value when any bits that are set in the mask are on in the input value
5	Send a true value when any bits that are set in the mask are off in the input value
6	Send a true value when the input value is equal to the value of the mask
7	Send a true value when the input value is not equal to the value of the mask
8	Send a true value when the signed input value is < the value of the mask
9	Send a true value when the signed input value is < or = to the value of the mask
10	Send a true value when the signed input value is > the value of the mask
11	Send a true value when the signed input value is > or = to the value of the mask
12	Send a true value when the unsigned input value is < the value of the mask
13	Send a true value when the unsigned input value is < or = to the value of the mask
14	Send a true value when the unsigned input value is > the value of the mask
15	Send a true value when the unsigned input value is > or = to the value of the mask

Scale

When [Function Sel] is set to thirteen, the Scale function is used to set an input and output range for the value present at In1. The values at In2 and In3 specify the maximum and minimum input values for In1. The output is scaled between the values of In4,In5 (max) and In6,In7 (min). In4 and In6 are Output 1 (whole number), In5 and In7 are Output 2 (fractional number) of the double word output. (In8 is not used) Refer to figure 2.



numbers shown in () are an example.

Figure 2

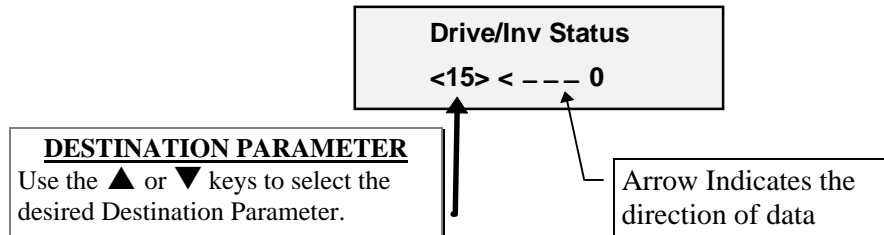
In 1 Value	Output Value
+10	4096
+5	3072
0	2048
-5	1024
-10	0

**APPLICATION
CONSIDERATION**

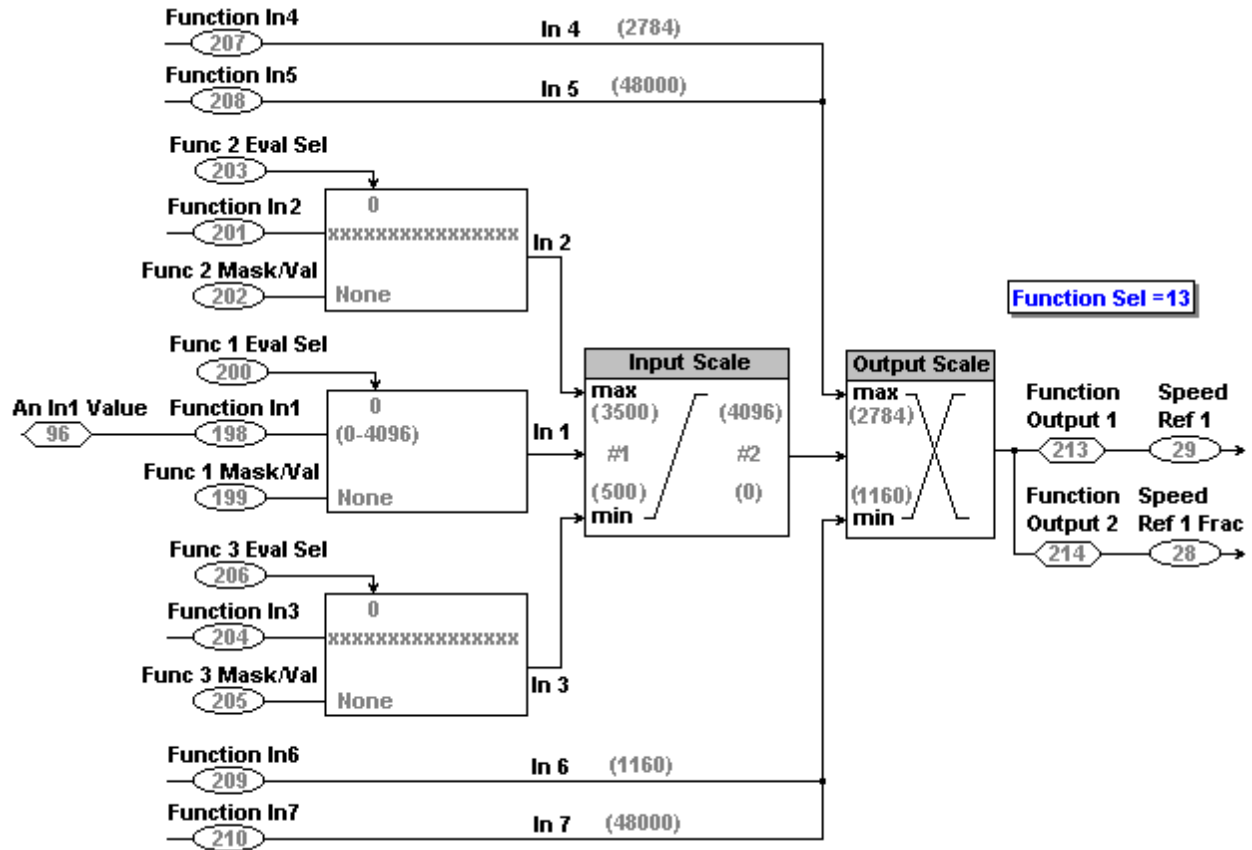
The Function Input parameters for the multiply/divide block are *linkable destination* type parameters. This means that other parameter values may be directly sent to, or linked, to these locations. All function inputs that are used by the function block must be programmed with a constant value or have a link.

The Function Output parameter is a *source* parameter. This parameter must be linked to a destination parameter.

The LINK menu of the Human Interface Module is used to create parameter links. An example of the link display is shown below.



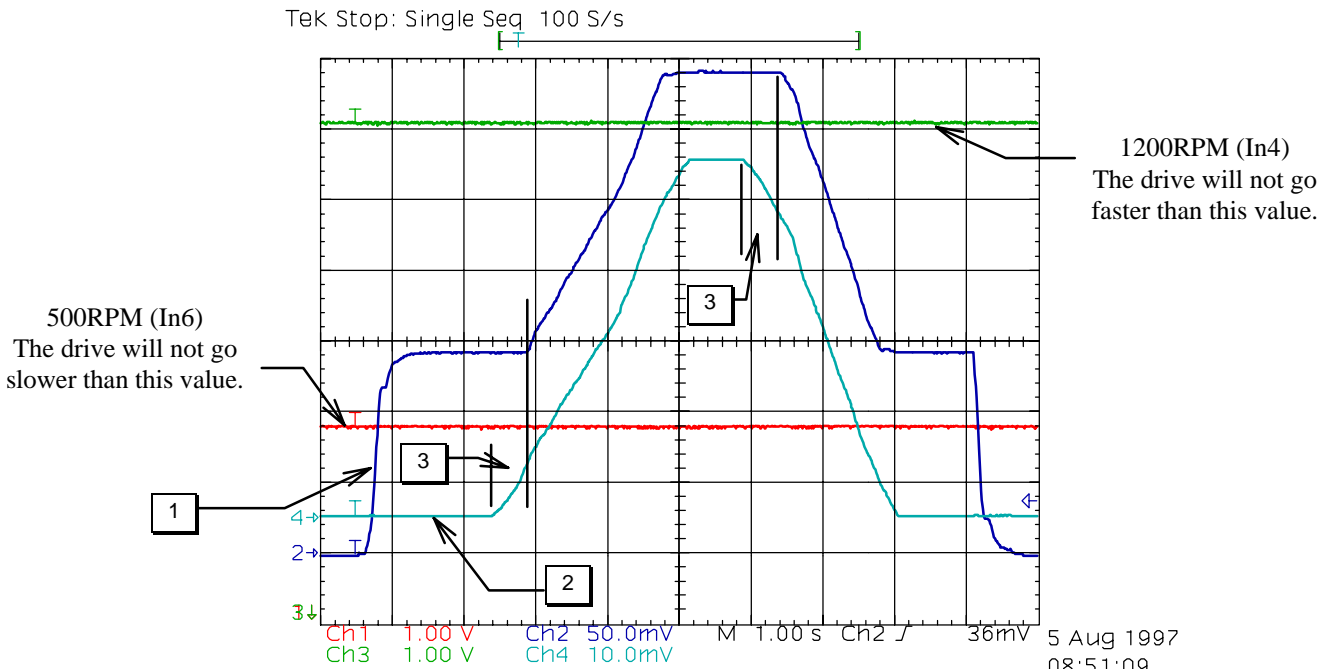
**APPLICATION
EXAMPLE**



Allen-Bradley

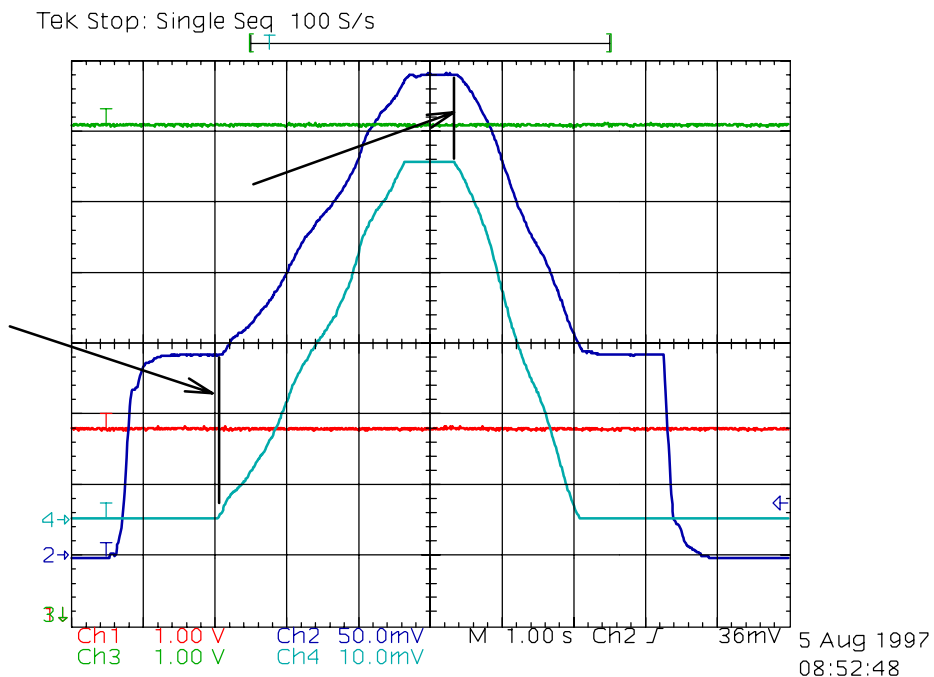
In the following example the drive is set up to run at a minimum speed of 500rpm and a maximum of 1200rpm. A potentiometer is wired to the analog input and is scaled such that the minimum value that the drive would consider is 500. The maximum value is 3500. This means if the pot is at zero and is increased, the drive would not react until the value for the analog input reached 500. It would then increase speed until the value reached 3500. After that it would not react to the potentiometer.

- 1.) As soon as the drive is started the speed jumps to 500rpm.
- 2.) Even though the analog pot is at zero.
- 3.) As the analog pot increases the speed does not change (dead band). And again at top speed starting to decrease speed there is dead band. Dead band is set up by In2 and In3.



Plot #1

In this example the dead band was removed.



Plot #2