SIEMENS

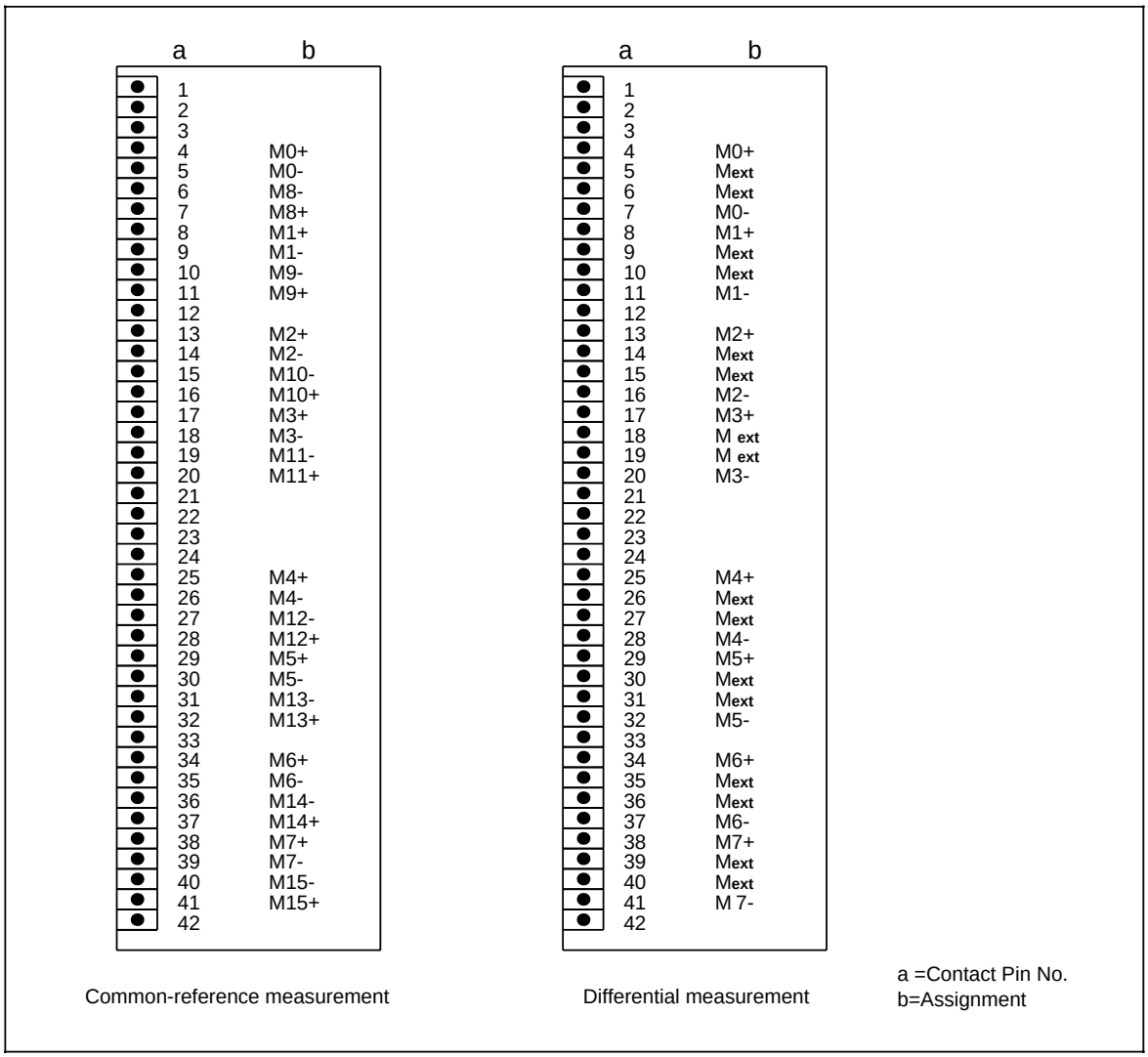
Product Information on
Analog Input Module 16 x I/V or 8 x I/V, Floating (6ES5 466-4UA11)

1. New analog input module

The 16 x I/V or 8 x I/V floating analog input module is a reworked analog input module for use with the S5-115U/H/F and S5-135/155 PLCs.
It replaces the previous analog input module 6ES5 466-3LA11.
Please refer to the pertinent manuals for a description of the module. This product information describes only the changes with respect to the 466-3LA11 and startup.

2. Terminal Assignment of the Front Connector

Note: Please note that the pin assignments differ from those of the 466-3LA11.



3. Technical Specifications (6ES5 466-4UA11)

Number of inputs	16 individual or 8 differential inputs in groups of 4 or 2 channels (switchable) voltage measurement or current measurement
Floating	yes
Input ranges	0 to 20 mA, 4 to 20 mA, ±20 mA, 0 to 1.25 V, 0 to 2.5 V, 0 to 5 V, 1 to 5 V, 0 to 10 V, ±1.25 V, ±2.5 V, ±5 V, ±10 V
Input resistance	
- Voltage measuring range	10 M
- Current measuring range	125
Type of connection for sensors	Two-wire connection
Digital representation of the input signal	Any of the following representations - 12 bits two's complement - 11 bits + sign - 12 bits binary
Measuring principle	Momentary value decoding
Conversion principle	Successive approximation
Conversion time typically	25 µsec. (per channel)
Coding time (per measured value)	250 µsec.
Duration of cyclic sampling (scan time)	
- for 8 measured values	maximum 2 msec.
- for 8 measured values	maximum 4 msec.
Max. permissible input voltage (without destruction)	maximum ±30V (static) or ± 75V (Pulse for max. 1 msec. and a duty cycle 1:20)
Permissible isolation voltage between the reference potential and the central grounding point	maximum 60 V AC/75 V DC
Error indication for	
- Overflow	yes (overflow bit set)
- Internal errors	yes (error bit (= E bit) set)
Noise suppression common mode noise (V_{PP}=1 V)	minimum 70 dB

Basic error limits	
- Voltage ranges outside 0 to 1.25 V, +1.25 V	0.1 %
- Current ranges and 0 to 1.25 V, +1.25 V	***0.2 %***
Operational error limits (0 °C to 60 °C)	
- Voltage ranges outside 0 to 1.25 V, +1.25 V	0.2 %
- Current ranges and 0 to 1.25 V, +1.25 V	***0.24 %***
Individual errors	
- Linearity	0.02 %
- Tolerance	0.05 %
- Polarity error	0.05 %
Temperature error	0.005 %/K
Cable length	
- shielded	maximum 200 m (656 ft.)
Front connector	***42 pins***
Isolation rating	to VDE 0160
Rated isolation voltage (channels to grounding point) tested with	500 V
Supply voltage	
- internal	+5 V+/- 5 %
- external	none
Internal current consumption	***typically 0.6 A***
Power losses of the module	***typically 3 W***
Weight	approx. 0.4 kg
Design	ES 902

4. Start -Up of the 466-4UA11 Analog Input Module

The operating mode of the 466 analog input module is set exclusively via switches on the the printed circuit board. Figure 1 shows the labelling and locations of the switches on the PCB.
Switches ***S9*** and ***S3*** are new or have been modified.

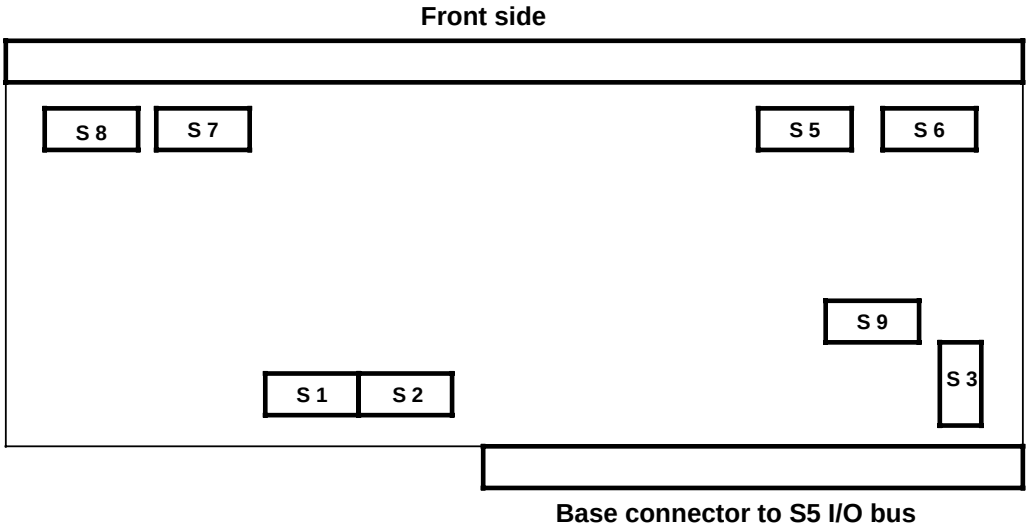


Figure 1 Locations of the Mode Selectors

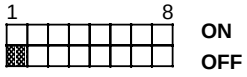
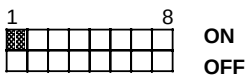
> **Note**
>
> An adapter casing (e.g. 6ES5 491-0LB12) is required for using the 466 analog input module in the PLC.
> You also require a 42-pin front connector K;
> - 6ES5 497-4UA12 for crimp connections
>   or
> - 6ES5 497-4UB31 for screw connections.

Setting the Type of Measurement

Common-reference Measurement/Differential Measurement

Set switch **S 9** to the type of measurement (common-reference or differential). The switch positions refer to the module as represented in Figure 1:

Table 1 Setting the Type of Measurement (Common-Reference or Differential)

Type of Measurement	Switch Position S 9
Common-reference measurement	
Differential measurement	

Current/Voltage Measurement for Individual Channel Groups

If you have set ***differential measurement*** at Switch ***S 9***, there are two channel groups available to you, each with four channels. You can configure each channel group separately for current or voltage measurement. For this purpose, you must set the switches **S 5**, **S 6**, **S 7** and **S 8** (see Table 2 and 3). Switches S 5 and S 7 permit three settings (Left, Middle, Right); switches S 6 and S 8 permit two settings (Left, Right). The switch positions refer to the module as represented in Figure 1:

Table 2. Setting Current/Voltage Measurement for Channel Group I

Channel Group I (Channel 0 to 3)	Switch S 5	Switch S 6
Current		
Voltage		

Table 3. Setting Current/Voltage Measurement for Channel Group II

Channel Group II (Channel 4 to 7)	Switch S 7	Switch S 8
Current		
Voltage		

If you have set ***common-reference measurement*** at Switch **S 9**, there are four channel groups available to you, each with four channels. You can configure each channel group separately for current or voltage measurement. For this purpose, you must set the switches **S 5, S 6, S 7** and **S 8** (see Table 4 to 7). Switches S 5 and S 7 permit three settings (Left, Middle, Right); switches S 6 and S 8 permit two settings (Left, Right). The switch positions refer to the module as represented in Figure 1:

Table 4. Setting Current/Voltage Measurement for Channel Group I

Channel Group I (Channel 0 to 3)	Switch S 5
Current	
Voltage	

Table 5. Setting Current/Voltage Measurement for Channel Group II

Channel Group II (Channel 4 to 7)	Switch S 7
Current	
Voltage	

Table 6. Setting Current/Voltage Measurement for Channel Group III

Channel Group III (Channel 8 to 11)	Switch S 6
Current	
Voltage	

Table 7. Setting Current/Voltage Measurement for Channel Group IV

Channel Group IV (Channel 12 to 15)	Switch S 8
Current	
Voltage	

Setting the Measuring Range

The 466 analog input module has 12 measuring ranges. One measuring range can be selected for each channel group (i.e. for four inputs each), independently of the other channel groups.
Set the measuring ranges with switches S 1 and S 2. See Figure 2 for the assignment of switches to channel group.

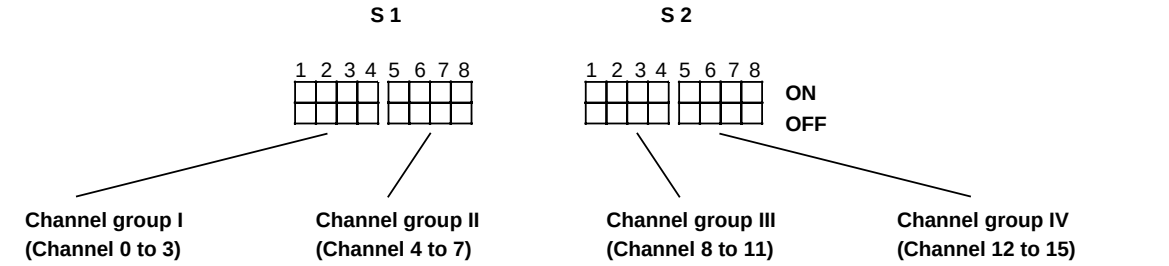
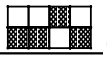
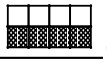
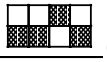
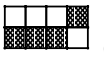
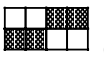
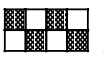
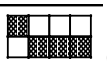
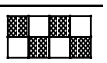
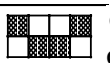
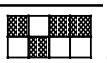
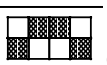
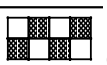


Figure 2. Assignment of Switches S 1/S 2 to Channel Group

The same measuring range coding applies to all channel groups. For this reason, the following table (see Table 8) contains only the measuring range setting for one channel group. The switch positions refer to the module as represented in Figure 1.
Please note that the type of measurement (current/voltage) must be set additionally with switches S 5 to S 8!

Table 8. Setting the Measuring Range for One Channel Group (4 Channels per Group)

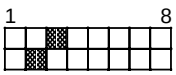
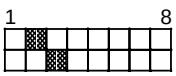
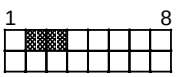
Measuring Range	Switch Positions
0 - 20 mA	 ON OFF
0 - 1.25 V	 ON OFF
0 - 2.5 V	 ON OFF
0 - 5 V	 ON OFF
0 - 10 V	 ON OFF
±20 mA	 ON OFF
±1.25 V	 ON OFF
±2.5 V	 ON OFF
±5 V	 ON OFF
±10 V	 ON OFF
4 - 20 mA	 ON OFF
1 - 5 V	 ON OFF

Setting the Data Format

The data format must be set with switch S 9:

- Two's complement - 12-bit two's complement representation (range: 0 to 4095 units unipolar, or - 2048 to+2047 units bipolar)
- Number with sign - 11-bit number and 1-bit sign (range: 0 to 4095 units unipolar, or - 2048 to+2047 units bipolar)
- Binary - 12-bit binary number (range 0 to 4095 both for unipolar and bipolar variables)

Table 9. Setting the Data Format

Data Format	Switch Position S 9
Two's complement	
Number with sign	
Binary	

Setting the Connection Type and the Module Starting Address

Table 10. Setting the Connection Type

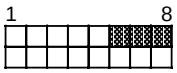
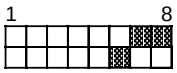
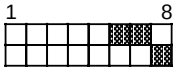
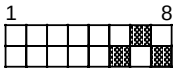
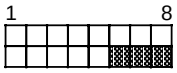
466-4UA11 Module	Switch Position S 9
When operating in CC or EU over distributed connections with IM 304/314, 307/317, 308/318-3, 300/312	P area 
	Q area 
	IM 3 area 
	IM 4 area 
When operating in distributed EU 701-2/3 with AS 301/310, EU 185 with AS 301/310	

Table 11. Setting the Module Starting Addresses for S5-135/155

Module Starting Address	Switch Position S 3
000 ($F000_H$)	
016* ($F010_H$)	
032 ($F020_H$)	
048* ($F030_H$)	
064 ($F040_H$)	
080* ($F050_H$)	
096 ($F060_H$)	
112* ($F070_H$)	

***** Can only be set in the case of differential measurement

Table 12. Setting the Module Starting Addresses for S5-115 and S5-135/155

Module Starting Address	Switch Position S 3
128 ($F080_H$)	 **ON** **OFF**
144* ($F090_H$)	 **ON** **OFF**
160 ($F0A0_H$)	 **ON** **OFF**
176* ($F0B0_H$)	 **ON** **OFF**
192 ($F0C0_H$)	 **ON** **OFF**
208* ($F0D0_H$)	 **ON** **OFF**
224 ($F0E0_H$)	 **ON** **OFF**
240* ($F0F0_H$)	 **ON** **OFF**

* Can only be set in the case of differential measurement