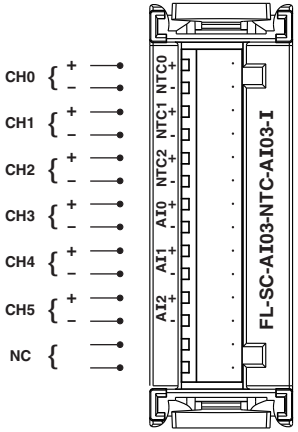
4. SOFTWARE DETAILS

1. Configure FL-SC-AI03-NTC-AI03-I card for a given Controller (Flexys series)using SELPRO programming software. For details of the software and configuration method, please refer to the software manual.
2. Auto generated FL-SC-AI03-NTC-AI03-I registers in SELPRO software :
   Example :
   FL-SC-AI03-NTC-AI03-I card is configured in Flexys series via SELPRO

R : Read only ; **Where x** = 0 to 5

REGISTER NAME	ATTRIBUTES	DESCRIPTION
PS1_AINTC3_PV0	R	Process Values for CH0 ~ CH5 At Over range / Under range condition : PS1_AINTC3_PVx = 0
PS1_AINTC3_PV1	R	
PS1_AINTC3_PV2	R	
PS1_AINTC3_PV3	R	
PS1_AINTC3_PV4	R	
PS1_AINTC3_PV5	R	
PS1_AINTC3_PVS0	R	Process value status for CH0 ~ CH5 At Over range condition : PS1_AINTC3_PVSx = 2 At Under range condition : PS1_AINTC3_PVSx = 1 Otherwise : PS1_AINTC3_PVSx = 0
PS1_AINTC3_PVS1	R	
PS1_AINTC3_PVS2	R	
PS1_AINTC3_PVS3	R	
PS1_AINTC3_PVS4	R	
PS1_AINTC3_PVS5	R	

5. TYPICAL WIRING DIAGRAM



6. SAFETY SUMMARY

- To prevent risk of electric shock, power supply to the controller must be kept off while wiring.
- Wiring shall be done strictly according to the terminal layout provided in the operating manual.

NOTE : For safety precautions, refer FL-TX4-LG-X-X-X / FL-RL-BS-6 operating instruction

DISCLAIMER LIABILITY

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Website : www.selec.com I Email : sales@selec.com

1. PRODUCT PROFILE

2. DESCRIPTION

- FL-SC-AI03-NTC-AI03-I card as shown in Figure 1.1is used as a plug-in module in Flexys series and not as an independent module.
- Easy to connect and replace
- Scaling to engineering units
- Real-time channel sampling

NOTE : For installation procedure, refer FL-TX4-LG-X-X-X / FL-RL-BS-6 Operating instruction.

Figure 1.1 : Front view

3. ELECTRICAL SPECIFICATIONS

	NTC	CURRENT
Number of Channels per card	3 Channels	3 Channels
Measurement Range	-40 ^{0} to 95 ^{0}C	0-20mA
Type of input	NA	Non-Differential
Digital resolution	14 bits	
Input impedance in signal range	NA	100^0
Analog input error at 25^{0}C	± 0.25 % of full scale ± 1^{0}C	± 0.25 % of full scale
Max input	NA	+ 50mA
Non linearity	± 0.25 % of full scale ± 1^{0}C	± 0.25 % of full scale
Conversion time	100 ms	
Protection against polarity inversion	Yes	
Under range value	< -40^{0}C	< -2mA
Over range value	> 95^{0}C	> +22mA
Channel isolation	No	
Operating Temperature	0^0 to 55^{0}C	
Storage Temperature	-20^0 to 70^{0}C	
Humidity	95%	
Connector	Spring type pluggable terminal block (3.50 mm pitch)	
Weight (g)	40	

OP565-V01

1. PRODUCT PROFILE

Figure 1.1 : Front view

2. DESCRIPTION

- FL-SC-AI04-U card as shown in figure 1.1 is used as a plug - in module in Flexys Series, EXP FLEX 2M, and not as an independent module
- Easy to connect and replace
- Scaling to engineering units

For installation procedure, refer FL-TX4-LG-X-X-X /FL-RL-BS-6/Flexys GT35/EXP FLEX 2MOperating Instruction.

3. ELECTRICAL SPECIFICATIONS

Number of Analog Input Channels	4
Conversion time	100 ms
Channel isolation	No
Operating Temerature	0 to 55°C
Storage Teperature	-20 to 70°C
Humidity	95.00%
Connector	Spring type pluggable terminal Block (3.5mm pitch)
Weight	39.0

ANALOG INPUT

Module	Voltage	Current	TC	RTD
Sensor type	0-10V(DC)	0-20mA(DC)	J,K,T,R,S,C,E,B,N,L, U,W,PLA TINEL II, MILLIVOLT(-5 TO 65mV)	PT-100
Measurement Range	0-10V(DC)	0-20mA(DC)	As per sensor selection	-100°C to 850°C
Input Impdance in signal range	330KΩ	100 Ω	470KΩ	470KΩ
Analog input error at 25°C	±0.25% of full scale	±0.25% of full scale	0.5% of full scale	0.1% of full scale
Absolute input range	±20V	+50mA	5V	NA
Non linearity	±0.25% of full scale	±0.25% of full scale	0.25% of full scale ±1°C	0.1 % of full scale±1°C
Under range value	<-1V	<-2mA	<-199°C	<-140°C
Over range value	>+11V	>+22mA	Depends on sensor type	>850°C
Resolution	2.44mv	4.88mA	0.1°C	0.1°C
Digital Resolution	14 bits	14 bits	14 bits	14 bits
Protection against polarity inversion	Yes	Yes	Yes	Yes

4. SOFTWARE DETAILS

1. Configure FL-SC-AI04-U card for a given Controller (Flexys series)using SELPRO programming software For details of the software and configuration method, please refer to the software manual.
2. Auto generated FL-SC-AI04-U registers in SELPRO software :
3. Sensor type initialized at power ON
   Example : FL-SC-AI04-U card is configured in Flexys series via SELPRO software in Slot number 1.

Register Name	Attributes	Description
PS1_AI4_U_SEN0	R/W	Sensor Selection PS1_AI4_U_SENx = 0 -12 (TC) PS1_AI4_U_SENx =13 (RTD) PS1_AI4_U_SENx =14 (mV) PS1_AI4_U_SENx =15 (V) PS1_AI4_U_SENx =16 (I)
PS1_AI4_U_SEN1	R/W	
PS1_AI4_U_SEN2	R/W	
PS1_AI4_U_SEN3	R/W	
PS1_AI4_U_PV0	R	Process values for CH0- CH3 At Sensor break / Sensor reverse / Over range / Under range : PS1_AI4_U_PVx = 0
PS1_AI4_U_PV1	R	
PS1_AI4_U_PV2	R	
PS1_AI4_U_PV3	R	
PS1_AI4_U_PVS0	R	Process value status for CH0 - CH3 At Sensor break / Over range condition : PS1_AI4_U_PVSx = 2 At Sensor reverse/ Under range condition : PS1_AI4_U_PVSx = 1 Otherwise when Sensor OK : PS1_AI4_U_PVSx = 0
PS1_AI4_U_PVS1	R	
PS1_AI4_U_PVS2	R	
PS1_AI4_U_PVS3	R	

R : Read only, R/W : Read / Write
Where x = 0 to 3

5. TYPICAL WIRING DIAGRAM

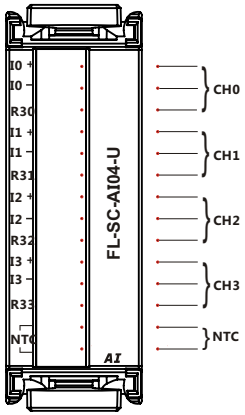

Figure 1.2 : Wiring Diagram

6. TYPICAL JUMPER SELECTION DIAGRAM

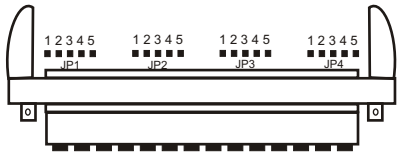

Figure 1.3 : Top view (Jumper Selection)

Analog Input		
Sensor type	Jumper selection	Jumper no.
TC / RTD	Short pin 1 & pin 2	JP1,JP2,JP3,JP4 for CH0, CH1, CH2,CH3 resp.
Current	Short pin 2 & pin 3	
Voltage	Short pin 4 & pin 5	

NOTE : Default jumper selections is TC/RTD (i.e.pin 1 & pin 2) for Analog Input

7. SAFETY SUMMARY

- To prevent risk of electric shock, power supply to the controller must be kept off while wiring.
- Wiring shall be done strictly according to the terminal layout provided in the operating manual.

NOTE : For safety precautions, refer FL-TX4-LG-X-X-X / FL-RL-BS-6 / FlexysGT35 Operating instruction.

DISCLAIMER LIABILITY

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(BSNL/MTNL Subscribers only) Website : www.selec.com | Email : sales@selec.com

4. SOFTWARE DETAILS

1. Configure FL-SC-AIDF04-TC card for a given controller (Flexys series) using SELPRO programming software.
   For details of the software and configuration method, please refer to the software manual.
2. Auto generated FL-SC-AIDF04-TC registers in SELPRO software :
   Example :
   FL-SC-AIDF04-TC card is configured in Flexys series via SELPRO software in slot number 1.

REGISTER NAME	ATTRIBUTES	DESCRIPTION
PS1_AI4_TC_SEN0	R/W	Sensor number for CH0 ~ CH3 **NOTE :** Refer software user manual for sensor number.
PS1_AI4_TC_SEN1	R/W	
PS1_AI4_TC_SEN2	R/W	
PS1_AI4_TC_SEN3	R/W	
PS1_AI4_TC_PV0	R	Process values for CH0 ~ CH3 At Sensor break / Sensor reverse / Over range / Under range condition : PS1_AI4_TC_PVx = 0
PS1_AI4_TC_PV1	R	
PS1_AI4_TC_PV2	R	
PS1_AI4_TC_PV3	R	
PS1_AI4_TC_PVS0	R	Process value status for CH0 ~ CH3 At Sensor break / Over range condition : PS1_AI4_TC_PVSx = 2 At Sensor reverse / Under range condition : PS1_AI4_TC_PVSx = 1 Otherwise : PS1_AI4_TC_PVSx = 0
PS1_AI4_TC_PVS1	R	
PS1_AI4_TC_PVS2	R	
PS1_AI4_TC_PVS3	R	

R/W : Read/Write ;
R : Read only ; **Where x** = 0 to 3

5. TYPICAL WIRING DIAGRAM

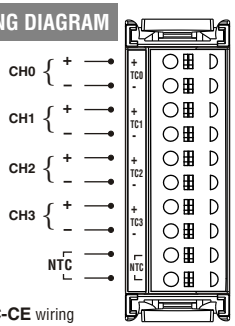

Figure 4.1 :
FL-SC-AIDF04-TC-CE wiring

6. SAFETY SUMMARY

- To prevent risk of electric shock, power supply to the controller must be kept off while wiring.
- Wiring shall be done strictly according to the terminal layout provided in the operating manual.

NOTE : For safety precautions, refer FL-TX4-LG-X-X-X / FL-RL-BS-6-CE operating instruction

7. ORDER CODE INFORMATION

ORDER CODE	DESCRIPTION	CERTIFICATION	
		CE	c UL us LISTED
FL-SC-AIDF04-TC-CE	TC Analog input	■	——

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OP476-V02

1. PRODUCT PROFILE

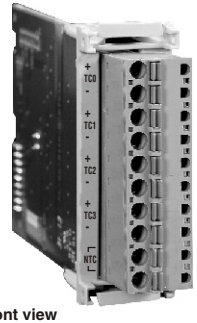

Figure 1.1 : **Front view**

2. DESCRIPTION

- FL-SC-AIDF04-TC-CE card as shown in Figure 1.1 is used as a plug-in module in Flexys series and not as an independent module.
- Easy to connect and replace
- Real-time channel sampling

NOTE : For installation procedure, refer FL-TX4-LG-X-X-X / FL-RL-BS-6-CE Operating instruction.

3. ELECTRICAL SPECIFICATIONS

Number of Channels per card	4 Channels
Sensor type	J, K, T, R, S, C, E, B, N, L, U, W, PLATINEL II, MILLIVOLT (-5 to 65mV)
Measurement Range	As per sensor selection
Type of input	Differential
Temperature resolution	0.1°C
Digital resolution for MILLIVOLT	14 bits
Input impedance in signal range	15 MΩ
Analog input error at 25°C	0.15 % of full scale ± 1°C
Absolute input range	5 V
Non linearity	0.15 % of full scale ± 1°C
Conversion time	300 ms
Protection against polarity inversion	Yes
Channel isolation	Yes
Operating Temperature	0 to 55°C
Storage Temperature	-20 to 70°C
Humidity	95%
Connector	Spring type pluggable terminal block (5.08 mm pitch)
Weight (g)	40

6. SAFETY SUMMARY

- To prevent risk of electric shock, power supply to the controller must be kept off while wiring.
- Wiring shall be done strictly according to the terminal layout provided in the operating manual.

NOTE : For Safety precautions, refer FL-TX4-LG-X-X-X / FL-RL-BS-6 Operating instruction

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1. PRODUCT PROFILE

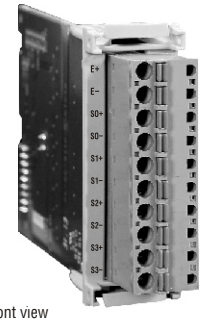


Figure 1.1 : Front view

2. DESCRIPTION

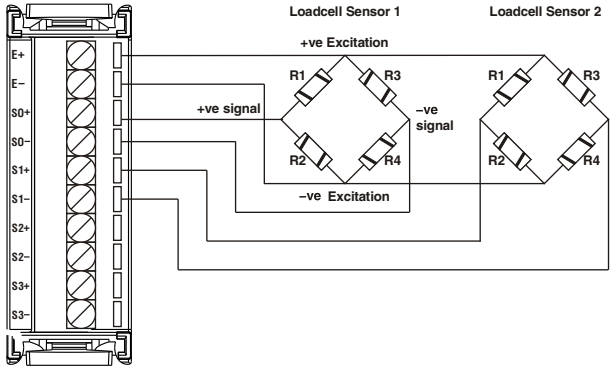
- FL-SC-LC04 as shown in Figure 1.1 is used as a plug-in module in Flexys series and not as an independent module.
- Easy to connect and replace
- Scaling to engineering units
- Real-time channel sampling

NOTE : For installation procedure, refer FL-TX4-LG-X-X-X / FL-RL-BS-6 Operating instruction

3. ELECTRICAL SPECIFICATIONS

No of Channels per card	4 Channels
Input signal range	±19.5mV, ±39 mV, ±1.25 V, ±2.5 V (selectable)
Excitation Output Voltage	5V DC ±10%
Type of input	Differential
Digital resolution	24 bits
Applicable sensor type	4 - wire
Input Offset Drift	100 nV/ ºC
Temperature coefficient Span	±2.5 ppm/ ºC
Linearity error	±0.05% of full scale reading
Gain Error	0.1%
Gain Drift	3 ppm/ ºC
Conversion method	Delta Sigma
Conversion time	50 ms to 400 ms (user configurable)
Permitted load cell resistance	350 Ω
Common mode rejection (CMRR @50/60 Hz)	≥ 100 dB
Operating Temperature	0 to 55°C
Storage Temperature	-20 to 70°C
Humidity	95.00%
Connector	Spring type pluggable terminal block (5.08 mm pitch)
Weight (g)	40

4. TYPICAL WIRING DIAGRAM



5. CALIBRATION PROCEDURE

Step 1 : CARD CONFIGURATION

R : Read only ; **R/W :** Read/Write

NOTE : The FL-SC-LC04 card has to be calibrated along with the sensor implemented in the setup. The calibration will remain valid to the same sensor and shall be re calibrated if sensor is changed/replaced.

1. Configure FL-SC-LC04 card for a given Controller (Flexys series) using SELPRO programming software.
   For details of the software and configuration method, please refer to the software manual.
2. Auto generated Loadcell registers in **SELPRO** software :
   Example : FL-SC-LC04 card is configured in Flexys series via SELPRO software in Slot number 1.

REGISTER NAME	ATTRIBUTES	DESCRIPTION
PS1_LC_GS_CH0	R/W	Set Gain value of CH0 ~ CH3, Default = 0
PS1_LC_GS_CH1	R/W	
PS1_LC_GS_CH2	R/W	
PS1_LC_GS_CH3	R/W	
PS1_LC_TrTrgr_CH0	R/W	Trigger bit of CH0 ~ CH3 for tare (to set present weight = 0)
PS1_LC_TrTrgr_CH1	R/W	
PS1_LC_TrTrgr_CH2	R/W	
PS1_LC_TrTrgr_CH3	R/W	
PS1_LC_WT_CH0	R	Present weight of CH0 ~ CH3
PS1_LC_WT_CH1	R	
PS1_LC_WT_CH2	R	
PS1_LC_WT_CH3	R	
PS1_LC_CS_CH0	R/W	Trigger bit of CH0 ~ CH3 for Conversion speed selection
PS1_LC_CS_CH1	R/W	
PS1_LC_CS_CH2	R/W	
PS1_LC_CS_CH3	R/W	
PS1_LC_Span_WT_CH0	R/W	Set Span weight input of CH0 ~ CH3 for calibration only
PS1_LC_Span_WT_CH1	R/W	
PS1_LC_Span_WT_CH2	R/W	
PS1_LC_Span_WT_CH3	R/W	

Step 2 : GAIN SELECTION

Maximum Loadcell Output at rated Load = Rated Output x Excitation Output voltage.
Example : Rated Output = 2 mV/V
Excitation Output Voltage = 5 V
So, Maximum Loadcell Output at Rated Load = +10 mV
Calculated Loadcell Output ≤ Max. Differential input. (See the table below)
Therefore, Gain (LC_GS_CHx) = 3 selected.

where x = 0,1,2,3

LC_GS_CHx	PGA (Programmable Gain Amplifier)	Max. Differential input
0	1	+/- 2.5 V
1	2	+/- 1.25 V
2	64	+/- 39 mV
3	128	+/- 19.5 mV

Step 3 : CONVERSION SPEED SELECTION

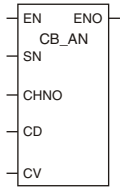
LC_CS_CHx	Conversion time/channel
0	100 ms
1	12.5 ms

Conversion Speed Calculation :

LC_CS_CH0	LC_CS_CH1	LC_CS_CH2	LC_CS_CH3	CH0 Response time
0	0	0	0	100 ms x 4 = 400 ms
1	1	1	1	12.5 ms x 4 = 50 ms
1	0	0	0	12.5 ms + (100 ms x 3) = 312.5 ms
1	1	1	0	(12.5 ms x 3) + 100 ms = 137.5 ms

NOTE : Set common conversion speed for all channel for better accuracy via SELPRO software.

Step 4 : CALIBRATION



Assign CALBANALOG block for calibration as shown, in **SELPRO** software. Now, Download the configuration in to Controller.

NOTE : During Calibration, set LC_TrTrgr_CHx=0

Abbreviation	Explanation
SN	Slot Number where the Load cell card is configured
CHNO	Channel number which is to be calibrated
CD	Calibration Code : 0 = to calibrate at Zero weight 1 = to calibrate at Span weight
CV	NA for Loadcell

Zero Calibration
1) Set SN = 1 (Slot Number)
2) Set CD = 0
3) Remove weight
4) Trigger EN pin
5) Observe present weight in PS1_LC_WT_CH0
6) Zero calibration done

Span Calibration
7) Set CD=1
8) Put max. known weight on sensor
9) Set PS1_LC_SPAN_WT_CH0 = counts required against known weight

Example : Max. known weight = 1 kg
Set PS1_LC_SPAN_WT_CH0 = 1000; if 1 g resolution is required
Set PS1_LC_SPAN_WT_CH0 = 1000000; if 1 mg resolution is required

NOTE : Span counts should not exceed digital resolution of FL-SC-LC04
10) Trigger EN pin
11) Observe present weight in PS1_LC_WT_CH0
12) Span weight calibration done