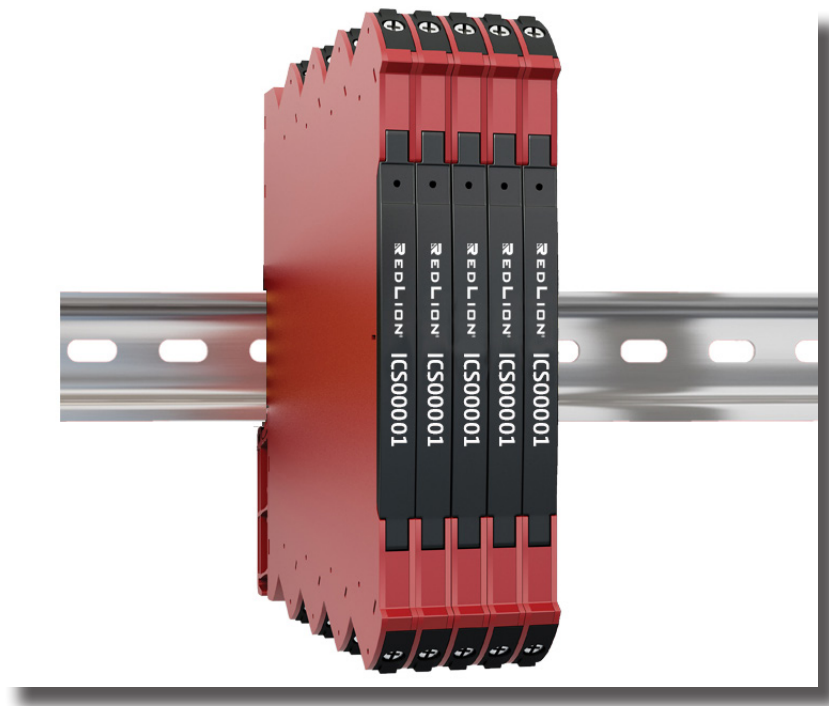


Product manual

ICS

6 mm isolator and converter



6 mm Isolator and Converter ICS

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Warnings



GENERAL

To avoid the risk of electric shock and fire, the safety instructions of this product manual must be observed, and the guidelines followed. The specifications must not be exceeded, and the device must only be applied as described in the following.

Prior to the commissioning of the device, this product manual must be examined carefully.

Only qualified personnel (technicians) should install this device. If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

To avoid explosion and serious injury: Modules having mechanical failures must be returned to Red Lion Controls for repair or replacement.

Repair of the device and replacement of circuit breakers must be done by Red Lion Controls only.



**HAZARDOUS
VOLTAGE**

Until the device is fixed, do not connect hazardous voltages to the device.

In applications where hazardous voltage is connected to in-/outputs of the device, sufficient spacing or isolation from wires, terminals, and enclosure - to surroundings (incl. neighboring devices), must be ensured to maintain protection against electric shock.



CAUTION

Potential electrostatic charging hazard. To avoid the risk of explosion due to electrostatic charging of the enclosure, do not handle the units unless the area is known to be safe, or appropriate safety measures are taken to avoid electrostatic discharge.

Symbol identification



Triangle with an exclamation mark: Warning /demand. Potentially lethal situations. Read the manual before installation and commissioning of the device in order to avoid incidents that could lead to personal injury or mechanical damage.



The CE mark proves the compliance of the device with the essential requirements of the EU directives.



The UKCA mark proves the compliance of the device with the essential requirements of the UK regulations.



Ex devices have been approved acc. to the ATEX directive for use in connection with installations in explosive areas. See installation instructions.

Safety instructions

Receipt and unpacking

Unpack the device without damaging it and check whether the device type corresponds to the one ordered. The packing should always follow the device until this has been permanently mounted.

Environment

Avoid direct sun light, dust, high temperatures, mechanical vibrations and shock, and rain and heavy moisture. If necessary, heating in excess of the stated limits for ambient temperatures should be avoided by way of ventilation.

The device must be installed in pollution degree 2 or better.

The device is designed to be safe at least under an altitude up to 2000 m.

The device is designed for indoor use.

Mounting

Only technicians who are familiar with the technical terms, warnings, and instructions in the manual and who are able to follow these should connect the device. Should there be any doubt as to the correct handling of the device, please contact your local distributor or, alternatively,

Red Lion Controls
www.redlion.net

Mounting and connection of the device should comply with national legislation for mounting of electric materials, e.g. wire cross section, protective fuse, and location.

Descriptions of input / output and supply connections are shown in the block diagram and side label.

The device is provided with field wiring terminals and shall be supplied from a Power Supply having double / reinforced insulation. A power switch should be easily accessible and close to the device. The power switch shall be marked as the disconnecting unit for the device.

The ICS must be mounted on a DIN rail according to EN 60715.

Year of manufacture can be taken from the first two digits in the serial number.

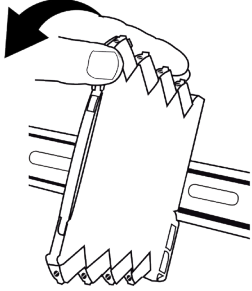
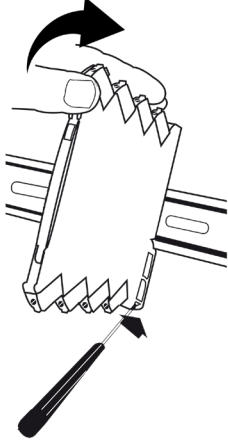
Cleaning

When disconnected, the device may be cleaned with a cloth moistened with distilled water.

Liability

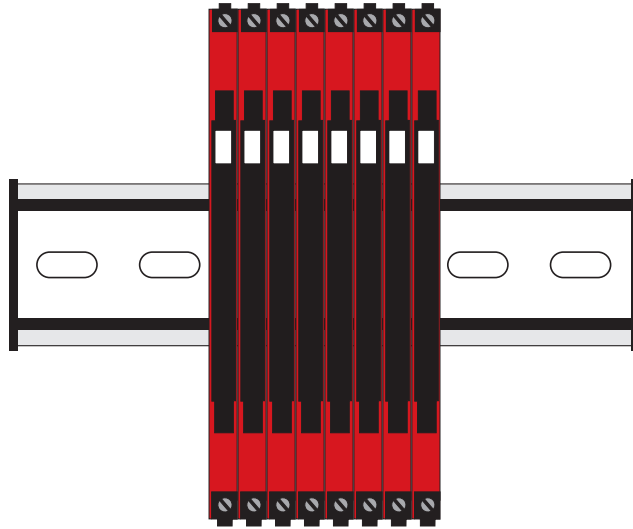
To the extent the instructions in this manual are not strictly observed, the customer cannot advance a demand against Red Lion Controls that would otherwise exist according to the concluded sales agreement.

Mounting / demounting of ICS

Mounting on DIN rail (Fig.1)	Demounting from DIN rail (Fig.2)
<p data-bbox="268 225 571 257">Click the device onto the rail</p>	<p data-bbox="807 225 1390 353">First, remember to demount the connectors with hazardous voltages. Detach the device from the rail by moving the bottom lock down.</p>
	

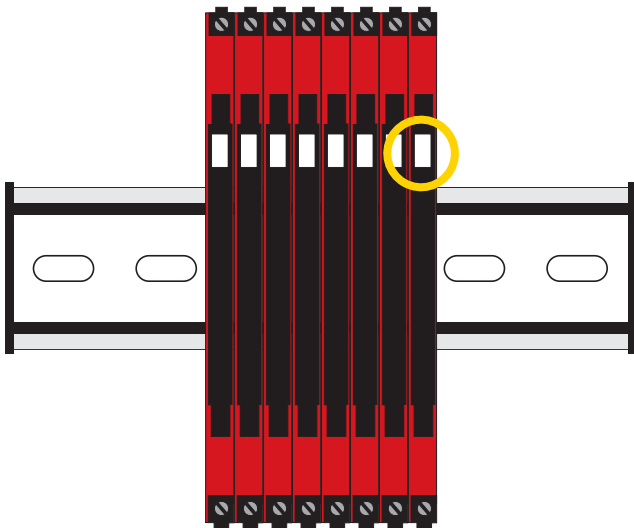
Installation on DIN rail

The ICS must be installed on a DIN rail.



Marking

The front cover of the ICS has been designed with an area for affixation of a click-on marker. The area assigned to the marker measures 5 x 7.5 mm. Markers from Weidmüller's MultiCard System, type MF 5/7.5, are suitable.



Flexible supply

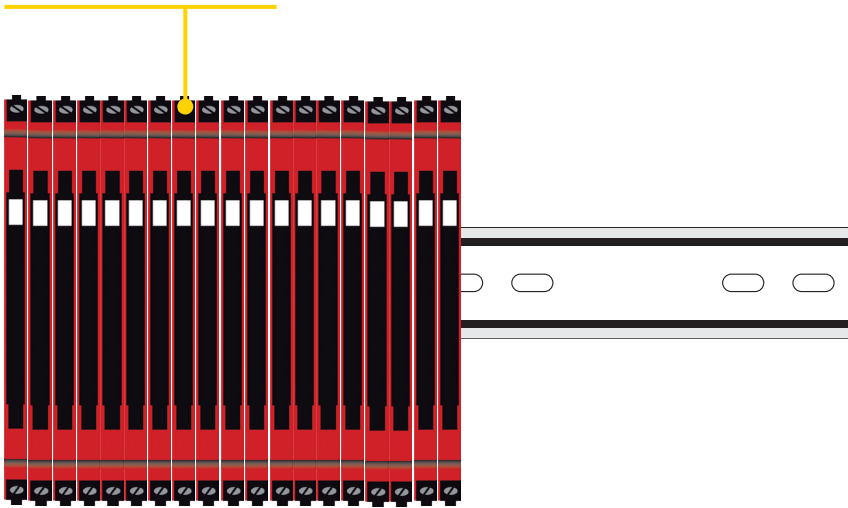
The technical specifications specify the maximum required power at nominal operating values, e.g. 24 V supply voltage, 60°C ambient temperature, 600 Ω load, and 20 mA output current.

External protective fuses may be required depending on power source selected. Protective fuse ratings are specified below.

DIN rail solution - device daisy chain:

The units can be supplied with 24 VDC $\pm 30\%$ via direct wiring and a loop between the devices.

Protective fuse: 2.5 A.



External fuse characteristics:

The 2.5 A fuse must break after not more than 120 seconds at 6.4 A.

6 mm Isolator and Converter ICS

The ICS is a slimline isolator for 24 VDC fixed supply and can be used for different purposes.

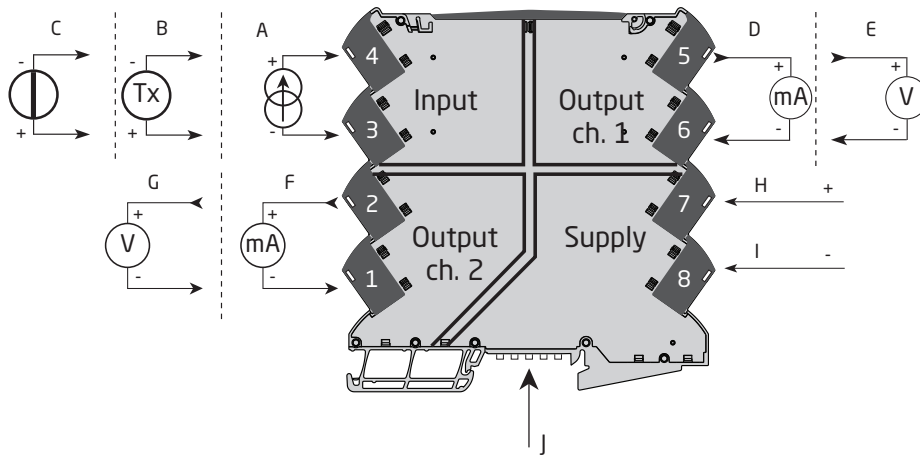
- Can be supplied separately
- Can be delivered with customer parameterisation on request
- Approvals by CE, UL, ATEX zone 2, IECEx zone 2 and UKEX zone 2
- Possibility of loop supply output

Applications

The ICS isolator is designed for the automation and process industries. The ICS is the result of extensive development and test procedures making it very well suited for conversion and galvanic isolation in the following applications:

- Isolation and 1:1 conversion of current signals in the range 0...20 mA.
- Isolation and conversion of standard DC signals.
- Power supply and signal isolator for 2-wire transmitters.
- Isolation and splitting of standard DC signals.
- Installation in ATEX Ex zone 2 / IECEx zone 2 / UKEX zone 2.
- Suitable for environments with high vibration stress

Connections



**Safe Area or
Zone 2 & Cl. 1, Div. 2, gr. A-D**

	Input signals	ICS00001
A	Current	x
B	Tx	x
C	Voltage	x

	Output signals	ICS00001
D	Current 1	x
E	Voltage 1	x
F	Current 2	x
G	Voltage 2	x

	Supply	ICS00001
H	Supply +	x
I	Supply -	x

Product overview

RL part no.	ICS00001
RL product name	Isolated converter / splitter
Description	Loop isolator / converter for standard DC signals. DIP-switch setup. Dual output.
Parameterisation	DIP-switch
Input signal	0/2...10 V 0/1...5 V 0/4...23 mA
Loop supply output	>17 V @ 20 mA
Output signal (active)	0/2...10 V 0/1...5 V 0/4...23 mA
Approvals	UL, safety, ATEX zone 2, IECEX zone 2, UKEX zone 2

Ordering information

Description	Part Number
Isolated converter / splitter	ICS00001

Technical data

Environmental conditions:

Operating temperature	-25°C to +70°C
Storage temperature	-40°C to +85°C
Calibration temperature.	20...28°C
Relative humidity	< 95% RH (non-cond.)
Protection degree	IP20
Installation in pollution degree 2 & overvoltage category II.	

Mechanical specifications:

Dimensions (HxWxD)	113 x 6.1 x 115 mm
Weight approx.	70 g
DIN rail type.	DIN EN 60715 - 35 mm
Wire size.	0.13...2.5 mm ² / AWG 26...12 stranded wire
Screw terminal torque.	0.5 Nm
Vibration.	IEC 60068-2-6
2...25 Hz.	±1,6 mm
25...100 Hz.	±4 g

Common electrical specifications:

Supply voltage, DC. 16.8...31.2 VDC

Power requirements:

Max. power dissipation	Max. required power
0.60 W	1.20 W

Max. required power is the maximum power needed at power supply terminals or rail connector.

Max. power dissipation is the maximum power dissipated at nominal operating values.

Isolation voltage, test 2.5 kVAC
 Isolation voltage working 300 VAC (reinforced) /
 250 VAC (Zone 2, Div. 2)
 Double isolation Input / output 1 / output 2 / supply
 Signal dynamics, input / output Analog signal chain
 Signal / noise ratio Min. 60 dB
 Cut-off frequency (3 dB) > 100 Hz
 Response time (0...90%, 100...10%):
 mA / V input < 7 ms
 Accuracy < ±0.05% of span
 Temperature coefficient < ±0.01% of span / °C

EMC immunity influence	< ±0.5% of span
----------------------------------	-----------------

Auxiliary supplies:

2-wire supply (terminal 3 and 4) > 17 VDC / 20 mA

Current input:

Measurement range 0...23 mA
 Programmable measurement ranges 0...20 and 4...20 mA
 Input voltage drop < 1.5 VDC
 Input resistance Nom. 20 Ω + PTC 50 Ω

Voltage input:

Measurement range 0...10.25 VDC
 Programmable measurement ranges 0...10 / 2...10 / 0...5 / 1...5 VDC
 Input resistance ≥ 500 kΩ

Current output:

Signal range (span) 0...23 mA
 Programmable signal ranges 0...20 / 4...20 mA
 Load ≤ 300 Ω per channel
 Load stability < 0.002% of span / 100 Ω
 Current limit ≤ 28 mA

Voltage output:

Signal range 0...10 VDC
 Programmable signal ranges 0...10 / 2...10 / 0...5 / 1...5 VDC
 Load (min.) >10 kΩ

of span = of the selected range

Observed authority requirements:

EMC 2014/30/EU & UK SI 2016/1091
LVD 2014/35/EU & UK SI 2016/1101
RoHS 2011/65/EU & UK SI 2012/3032
ATEX Zone 2

Approvals:

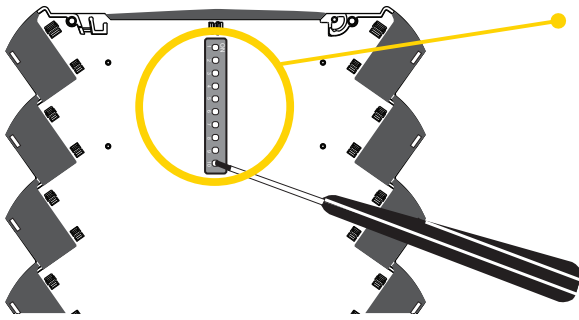
c UL us, UL 61010-1. E179259

I.S. / Ex approvals:

ATEX Zone 2
IECEX DEK 19.0002X
UKEX DEK21UKEX0055X

DIP-switch configuration

Applicable devices can be configured via DIP-switches. The DIP-switches are located on the side of the device and can be adjusted with a small screwdriver or other implement.



Default factory settings are:
Input = 0...20 mA
Output = 0...20 mA
All DIP-switches in the OFF position

The tables below show the configuration based on DIP-switch settings.
NA = no function of DIP-switch.

ICS00001

Input setup					Output setup						
					Channel 1			Channel 2			
	1	2	3	4		5	6	7	8	9	10
0...20 mA	OFF	OFF	OFF	OFF	0...20 mA	OFF	OFF	OFF	OFF	OFF	OFF
4...20 mA	OFF	OFF	ON	OFF	4...20 mA	OFF	ON	OFF	OFF	ON	OFF
0...10 V	OFF	ON	OFF	OFF	0...10 V	ON	OFF	OFF	ON	OFF	OFF
2...10 V	OFF	ON	ON	OFF	2...10 V	ON	ON	OFF	ON	ON	OFF
0...5 V	OFF	ON	OFF	ON	0...5 V	ON	OFF	ON	ON	OFF	ON
1...5 V	OFF	ON	ON	ON	1...5 V	ON	ON	ON	ON	ON	ON
0...20 mA Tx	ON	OFF	OFF	OFF							
4...20 mA Tx	ON	OFF	ON	OFF							

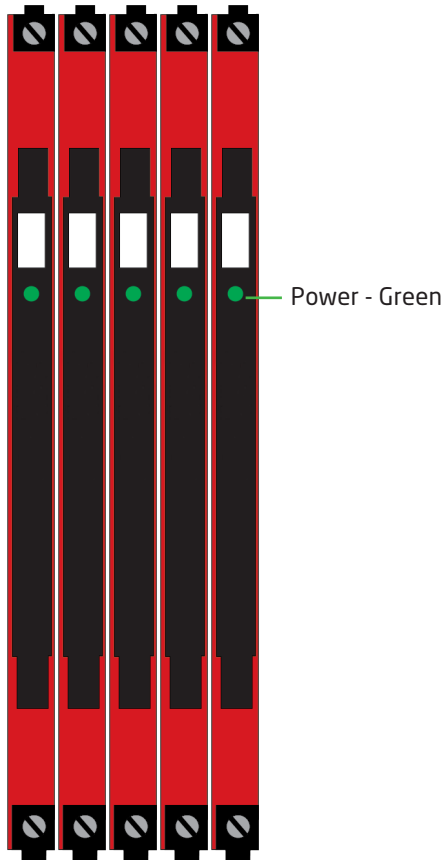
Remember to cycle power for terminals to reload DIP-switch values at power up.

Operation & troubleshooting

The ICS devices provide multiple features for easy user operation and for performing efficient troubleshooting.

Monitoring the operational status is easy from the front LED.

Status indicator front LED



Condition	LED	Output and loop supply	Action required
No supply / device error	OFF	De-energized	Connect supply / replace device
Power-up or restart	1 Flash (0.5 s OFF + 0.5 s ON)	De-energized	-
Device OK	Flashing 13 Hz (15 ms ON)	Energized	-
Incorrect DIP-switch setting	Flashing 1 Hz (15 ms ON)	De-energized	Correct setting and re-power device
Restarting due to: Supply error/hardware. RAM or program flow error	Flashing 1 Hz (0.5 s ON)	De-energized	Adjust supply / replace device

Installation instructions

UL installation

Use 60/75°C copper conductors only.

Wire size AWG 26-12

UL file number E179259

The device is an Open Type Listed Process Control Equipment. To prevent injury resulting from accessibility to live parts the equipment must be installed in an enclosure. The power Supply unit must comply with NEC Class 2, as described by the National Electrical Code® (ANSI / NFPA 70).

IECEX, ATEX and UKEX installation in Zone 2

IECEX DEK 19.0002X Ex ec IIC T4 Gc

DEKRA 19ATEX0002X II 3 G Ex ec IIC T4 Gc

For safe installation, the following must be observed. The device shall only be installed by qualified personnel who are familiar with the national and international laws, directives and standards that apply to this area.

The devices shall be installed in a suitable enclosure providing a degree of protection of at least IP54 according to EN IEC 60079-0, taking into account the environmental conditions under which the equipment will be used.

When the temperature under rated conditions exceeds 70°C at the cable or conduit entry point, or 80°C at the branching point of the conductors, the temperature specification of the selected cable shall be in compliance with the actual measured temperature.

To prevent ignition of the explosive atmospheres, disconnect power before servicing and do not separate connectors when energized and an explosive gas mixture is present.

In class I, Division 2 or Zone 2 installations, the subject equipment shall be mounted within a tool-secured enclosure which is capable of accepting one or more of Class I, Division 2 wiring methods specified in the National Electrical Code (ANSI/NFPA 70) or in Canada in the Canadian Electrical Code (C22.1).

The ICS Isolator and Converter must be connected to limited output NEC Class 2 circuits, as outlined in the National Electrical Code® (ANSI / NFPA 70), only. If the devices are connected to a redundant power supply (two separate power supplies), both must meet this requirement.

Where installed in outdoor or potentially wet locations the enclosure shall at a minimum meet the requirements of IP54.

Warning: Substitution of components may impair suitability for zone 2 / division 2.

Warning: To prevent ignition of the explosive atmospheres, disconnect power before servicing and do not separate connectors when energised and an explosive gas mixture is present.

Red Lion Controls Technical Support

If for any reason you have trouble operating, connecting, or simply have questions concerning your new product, contact Red Lion's technical support.

Support: support.redlion.net

Inside US: +1 (877) 432-9908

Website: www.redlion.net

Outside US: +1 (717) 767-6511

Red Lion Controls, Inc.

35 Willow Springs Circle York, PA 17406

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LIMITED WARRANTY

(a) Red Lion Controls Inc. (the "Company") warrants that all Products shall be free from defects in material and workmanship under normal use for the period of time provided in "Statement of Warranty Periods" (available at www.redlion.net) current at the time of shipment of the Products (the "Warranty Period").

EXCEPT FOR THE ABOVE-STATED WARRANTY, COMPANY MAKES NO WARRANTY WHATSOEVER WITH RESPECT TO THE PRODUCTS, INCLUDING ANY (A) WARRANTY OF MERCHANTABILITY; (B) WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE; OR (C) WARRANTY AGAINST INFRINGEMENT OF INTELLECTUAL PROPERTY RIGHTS OF A THIRD PARTY; WHETHER EXPRESS OR IMPLIED BY LAW, COURSE OF DEALING, COURSE OF PERFORMANCE, USAGE OF TRADE OR OTHERWISE.

Customer shall be responsible for determining that a Product is suitable for Customer's use and that such use complies with any applicable local, state or federal law.

(b) The Company shall not be liable for a breach of the warranty set forth in paragraph (a) if (i) the defect is a result of Customer's failure to store, install, commission or maintain the Product according to specifications; (ii) Customer alters or repairs such Product without the prior written consent of Company.

(c) Subject to paragraph (b), with respect to any such Product during the Warranty Period, Company shall, in its sole discretion, either (i) repair or replace the Product; or (ii) credit or refund the price of Product provided that, if Company so requests, Customer shall, at Company's expense, return such Product to Company.

(d) THE REMEDIES SET FORTH IN PARAGRAPH (c) SHALL BE THE CUSTOMER'S SOLE AND EXCLUSIVE REMEDY AND COMPANY'S ENTIRE LIABILITY FOR ANY BREACH OF THE LIMITED WARRANTY SET FORTH IN PARAGRAPH (a).

BY INSTALLING THIS PRODUCT, YOU AGREE TO THE TERMS OF THIS WARRANTY, AS WELL AS ALL OTHER DISCLAIMERS AND WARRANTIES IN THIS DOCUMENT.