INSTRUCTION MANUAL

EtherCAT I/O MODULE
(strain gauge input, 2 points, isolated, screw terminal block)

MODEL **R7G4JECT-LC2-A**

Contents

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BEFORE USE ....

Thank you for choosing us. Before use, please check contents of the package you received as outlined below.
If you have any problems or questions with the product, please contact our sales office or representatives.

■ PACKAGE INCLUDES:

Strain gauge input module .....(1)
Surface mounter slider .....(2)

■ MODEL NO.

Confirm Model No. marking on the product to be exactly what you ordered.

■ INSTRUCTION MANUAL

This manual describes necessary points of caution when you use this product, including installation, connection and basic maintenance procedures.

■ ESI FILES

ESI files are downloadable at our website.

POINTS OF CAUTION

■ CONFORMITY WITH EU DIRECTIVE

- The equipment must be mounted inside the instrument panel of a metal enclosure.
- The actual installation environments such as panel configurations, connected devices, connected wires, may affect the protection level of this unit when it is integrated in a panel system. The user may have to review the CE requirements in regard to the whole system and employ additional protective measures* to ensure the CE conformity.
  * For example, installation of noise filters and clamp filters for the power source, input and output connected to the unit, etc.

■ POWER INPUT RATING & OPERATIONAL RANGE

- Locate the power input rating marked on the product and confirm its operational range as indicated below:
  24V DC rating: 24V ±10%, 150mA or less

■ GENERAL PRECAUTIONS

- Before you remove the unit or mount it, turn off the power supply and I/O signal for safety.
- Before you remove the terminal block or mount it, make sure to turn off the power supply and I/O signal for safety.

■ ENVIRONMENT

- Indoor use.
- When heavy dust or metal particles are present in the air, install the unit inside proper housing with sufficient ventilation.
- Do not install the unit where it is subjected to continuous vibration. Do not subject the unit to physical impact.
- Environmental temperature must be within -10 to +55°C (14 to 131°F) with relative humidity within 30 to 90% RH in order to ensure adequate life span and operation.

■ WIRING

- Do not install cables close to noise sources (relay drive cable, high frequency line, etc.).
- Do not bind these cables together with those in which noises are present. Do not install them in the same duct.
- Be sure to close the terminal cover for safety.

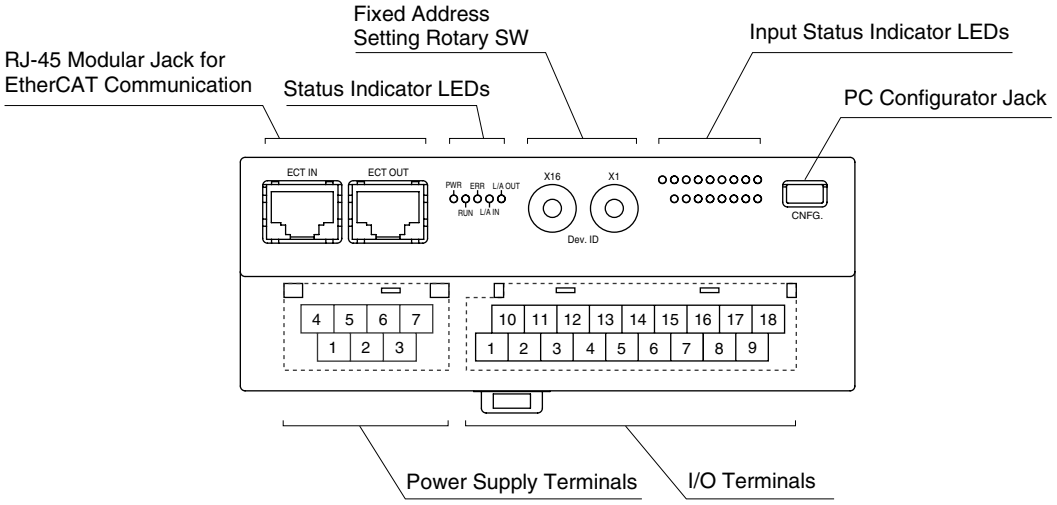
■ AND ....

- The unit is designed to function as soon as power is supplied, however, a warm up for 10 minutes is required for satisfying complete performance described in the data sheet.
- Settings from the host communication EtherCAT and from the configurator software (Model: R7CFG) cannot be used at the same time. Use either method of communication for setting parameters.

EtherCAT®

COMPONENT IDENTIFICATION

■ FRONT VIEW



■ STATUS INDICATOR LED

ID	COLOR	STATUS	
PWR	Green	–	Turns on when the internal power is supplied normally
		Off	Abnormal
		On	Normal
RUN	Green	–	Device state
		Off	INIT
		Blinking	PRE-OPERATIONAL
		Single Flash	SAFE-OPERATIONAL
		On	OPERATIONAL
ERR	Red	–	Error
		Off	No error
		Blinking	Invalid Configuration
		Single Flash	Local error
		Double Flash	Process Data Wachdog timeout
L/A IN	Green	–	IN port status
		Off	No Link
		Flickering	Link and activity
		On	Link without activity
L/A OUT	Green	–	OUT port status
		Off	No Link
		Flickering	Link and activity
		On	Link without activity

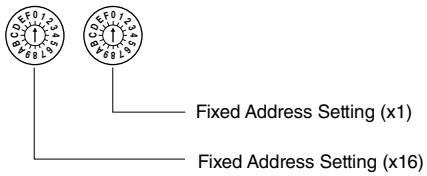
Blinking	200ms-On, 200ms-Off
Single Flash	200ms-On, 1000ms-Off
Double Flash	200ms-On, 200ms-Off, 200ms-On, 1000ms-Off
Flickering	50ms-On, 50ms-Off

■ INPUT STATUS INDICATOR LED

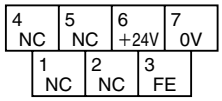
ID	COLOR	FUNCTION
A. ZERO	Green	Blink once when auto zero is performed
ZERO	Green	Blink once when zero adjustment is performed
SPAN	Green	Blink once when span adjustment is performed
MODE	Green	OFF at normal output mode ON at monitor output mode
RESET	Green	Blink once when reset offset
UNDER	Green	ON at (input signal ≤ -1%)
0-100	Green	ON at (-1% < input signal < 101%)
OVER	Green	ON at (input signal ≥ 101%)

■ FIXED ADDRESS SETTING ROTARY SW (ID selector)

Fixed address 1 to 255 can be set using the two rotary switches each marked 0 to F in combination.
When fixed address is not used, set the switches to 0.
Setting range: 0 to 255
Factory default: 0

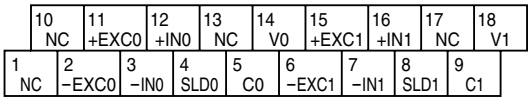


■ POWER SUPPLY TERMINAL ASSIGNMENT



1. NC	–
2. NC	–
3. FE	Functional earth
4. NC	–
5. NC	–
6. +24V	Power supply (24V DC)
7. 0V	Power supply (0V)

■ I/O TERMINAL ASSIGNMENT



NO.	ID	FUNCTION	NO.	ID	FUNCTION
1	NC	No connection	10	NC	No connection
2	–EXC0	Excitation 0 –	11	+EXC0	Excitation 0 +
3	–IN0	Input 0 –	12	+IN0	Input 0 +
4	SLD0	Shield 0	13	NC	No connection
5	C0	Monitor output 0 –	14	V0	Monitor output 0 +
6	–EXC1	Excitation 1 –	15	+EXC1	Excitation 1 +
7	–IN1	Input 1 –	16	+IN1	Input 1 +
8	SLD1	Shield 1	17	NC	No connection
9	C1	Monitor output 1 –	18	V1	Monitor output 1 +

PC CONFIGURATOR

The following parameter items can be configured with the PC configurator software (model: R7CFG).
Refer to the users manual of the software for detailed operations.

■ CHANNEL INDIVIDUAL SETTING

PARAMETER	SETTING RANGE	DEFAULT
Zero adjustment	-50 to +50%	-
Span adjustment	10% to full scale	full scale
Auto zero	-	-
Reset offset	-	-
Auto scale	0 to 32,000	-
Bias	-320.00 to +320.00 (%)	0.00 (%)
Gain	-3.2000 to +3.2000	1.0000
Zero scale	-32,000 to +32,000	0
Full scale	-32,000 to +32,000	10,000
Load coefficient	10.00 to 100.00 (%)	100.00 (%)
Moving average	2, 4, 8, 16, 32, 64, 128, 256, 512, 1024	16
Monitor output	-32,000 to +32,000	-
Output gain adjustment	-3.2000 to +3.2000	1.0000

■ CHANNEL BATCH SETTING

PARAMETER	SETTING RANGE	DEFAULT
Excitation	5V, 2.5V	5V
Lowpass filter	2Hz, 2kHz (1Hz)*	2kHz (1Hz)*

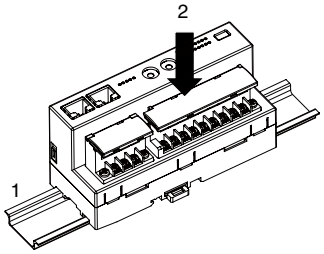
*. Values in ( ) are for the option code: /F1.

MOUNTING INSTRUCTIONS

■ DIN RAIL MOUNTING (PARALLEL)

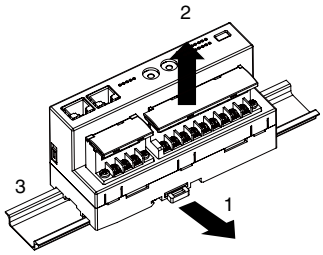
• Mounting the unit

1) Hook the upper hook at the rear side of the base onto the DIN rail.
2) Push the lower part of the unit in the direction of the arrow until the base is firmly fixed to the DIN rail.



• Removing the unit

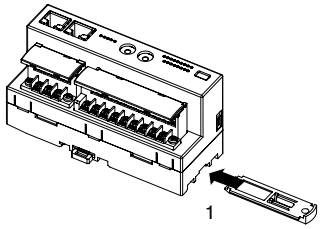
1) Push down the slider using a minus screwdriver.
2) Pull out the lower part of the unit.
3) Remove the upper part of the unit from the DIN rail.



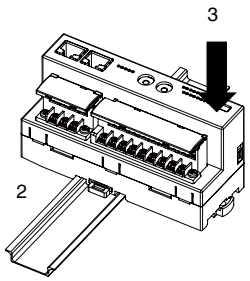
■ DIN RAIL MOUNTING (RIGHT ANGLE)

• Mounting

1) Insert the longer DIN rail mounter slider until it clicks twice, as shown below.

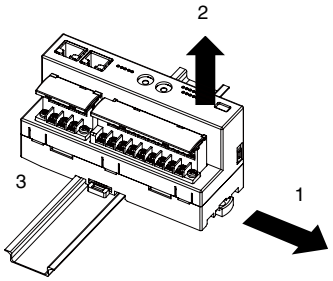


2) Set the upper hook at the rear side of the unit on the DIN rail.
3) Push the lower part in.



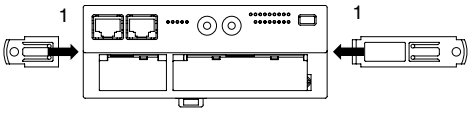
• Dismounting

1) Push down the DIN rail mounter slider with the tip of a flat-blade screwdriver.
2) Pull the lower part of the unit.
3) Remove the upper hook of the unit from the DIN rail.

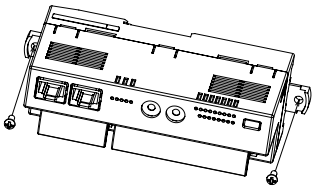


■ WALL MOUNTING

1) Insert the two DIN rail mounter sliders until they click once, as shown below.



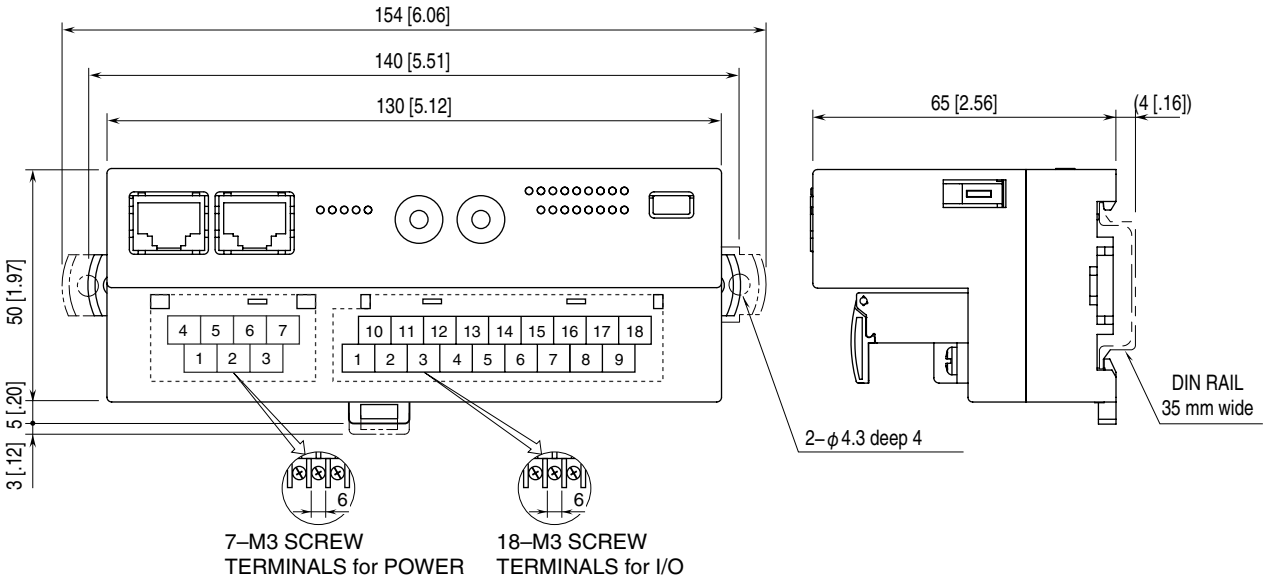
2) Mount the unit with M4 screws referring to the "MOUNTING REQUIREMENTS unit: mm [inch]" on page 6. (Torque: 1.4 N·m)



TERMINAL CONNECTIONS

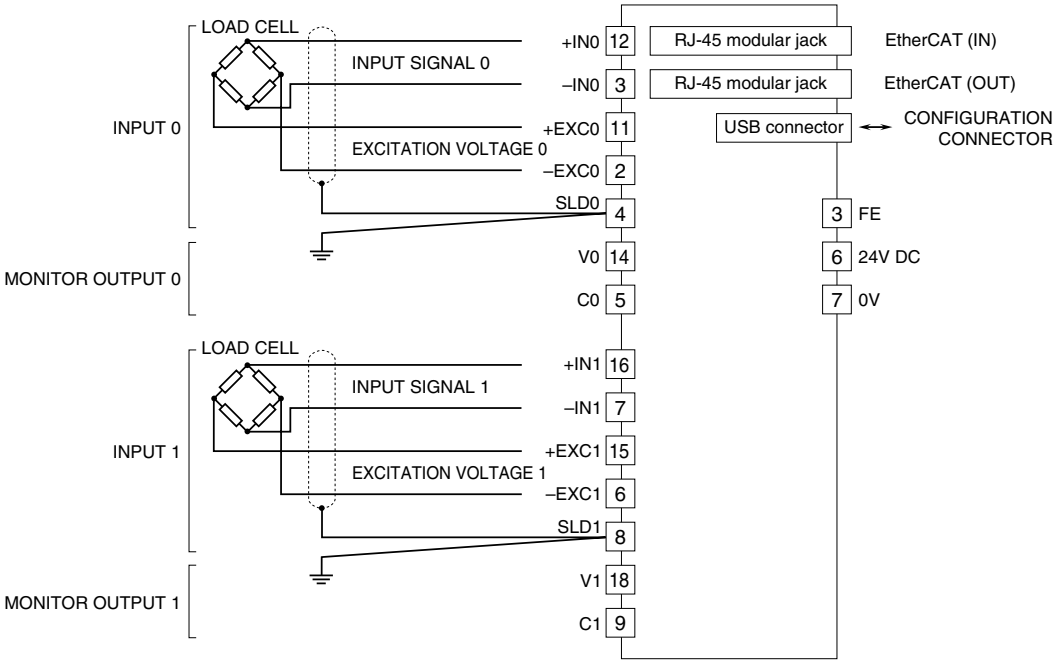
Connect the unit as in the diagram below.

■ EXTERNAL DIMENSIONS unit: mm [inch]

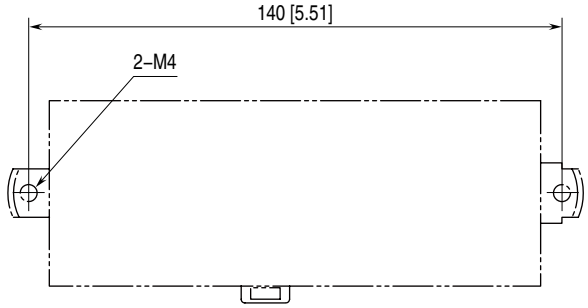


■ CONNECTION DIAGRAM

Note: In order to improve EMC performance, bond the FE terminal to ground.
Caution: FE terminal is NOT a protective conductor terminal.



MOUNTING REQUIREMENTS unit: mm [inch]



EtherCAT SPECIFICATIONS

■ Modular Device Profile

R7G4JECT-LC2-A complies with the Modular Device Profile (MDP) standard, ETG.5001.1 of the EtherCAT standard.
Be sure that the master supports the MDP standard.

■ Fixed address

R7G4JECT-LC2-A supports Explicit Device Identification by allowing setting of fixed address using the fixed address setting rotary switches (ID selector).
The fixed address can be set to be 1 to 255.
When fixed address is not used, set the ID selector to 0.

When the power is turned on with the ID selector set to other than 0, the designated address is written in the resistor 0x0012 of ESC (EtherCAT Slave Controller) when R7G4JECT starts up.

■ Initialization

At the start up, objects of the process data mapping (RxPDO, TxPDO) corresponding to the I/O data of the device, and the other objects are created in the object dictionary.
After initialization, the master unit can require to the slave unit (R7G4JECT-LC2-A) to switch the status from INIT to PREOP.
If the initialization is not completed due to any error with the unit, switching requirement is rejected with AL status code when switching from INIT to PREOP.

■ Data Configuration

Data configuration depends on the EtherCAT Modular Device Profile (MDP) specifications as follows.

Table 1: Data Configuration

OBJECT	ADDRESS	CONTENT
Device Type	0x1000	Device type
Manufacturer Device Name	0x1008	Device name
Manufacturer Hardware Version	0x1009	Hardware version
Manufacturer Software Version	0x100A	Software version
Identity Objects	0x1018	Vendor information
PDO Mapping Objects (RxPDO)	0x1600	Output data list
PDO Mapping Objects (TxPDO)	0x1A00	Input data list
Sync Manager Communication Type	0x1C00	Sync manager communication type
Sync Manager2 PDO Assignment (OUT)	0x1C12	Sync manager 2 PDO assignment (output)
Sync Manager3 PDO Assignment (IN)	0x1C13	Sync manager 3 PDO assignment (input)
Sync Manager2 Syncronization	0x1C32	Sync manager 2 synchronization
Sync Manager3 Syncronization	0x1C33	Sync manager 3 synchronization
Input Area Objects	0x6000, 0x6001	Input data, Status data
Output Area Objects	0x7000	Output data

■ EtherCAT State

EtherCAT defines four states of slave: INIT, PREOP, SAFEOP, and OP.
TxPDO (input configuration data) is updated only in the SAFEOP or OP state, and RxPDO (output configuration data) is updated only in the OP state.

For connected I/O module, the indicator LED turns on only in the OP state and data are updated.

■ EtherCAT Diagnostics

• AL Status Code

When the slave (R7G4JECT) fails to receive a request from the master or when there is a problem with the slave during normal communication, an error code is set to registers 0x0134 and 0x0135 (AL Status Code) of ESC.
R7G4JECT uses the following error codes.

Table 2: Error Codes of AL Status Code

CODE	ERROR
0x0000	No error
0x0011	Invalid requested state
0x0013	Unknown requested state
0x0016	BOOT state not supported
0x0017	Invalid MailBox configuration (PREOP)
0x001B	SyncManager configuration
0x001D	Invalid SyncManager (Output) Configuration
0x001E	Invalid SyncManager (Input) Configuration
0x001F	Invalid Watchdog Configuration
0x0029	FreeRun needs 3 Buffer mode

• SDO Abort Code

When the master attempts to access the object dictionary via SDO, if the slave (R7G4JECT) fails to receive SDO messages for some reason, R7G4JECT sends an error code (SDO Abort Code) to the master and rejects its access.
R7G4JECT uses the following error codes.

Table 3: Error Codes of SDO Abort Code

CODE	ERROR
0x05030000	Toggle bit not changed
0x05040001	Client/Server command specifier not valid or unknown
0x05040005	Out of memory
0x06010000	Unsupported access to an object
0x06010002	Attempt to a read-only object
0x06020000	The object does not exist in the object directory
0x06070010	Data type does not match, length of service parameter does not match
0x06090011	Sub-index does not exist
0x08000020	Data cannot be transferred or stored to the application
0x08000022	Data cannot be transferred or stored to the application because of the present device state

OBJECT DICTIONARY (DATA DESCRIPTION)

■ Device Type (0x1000)

The device type of this unit is allocated to object 0x1000. The device type is 5001 (0x00001389).

Table 4: Object Configuration For Device Type

INDEX	DATA TYPE	BIT	ACCESS	VALUE	CONTENT
0x1000	UINT32	32	RO	0x00001389	Device type

■ Error Register (0x1001)

The error register of this unit is allocated to object 0x1001.
R7G4JECT does not use object 0x1001.

■ Manufacturer Device Name (0x1008)

The device name is allocated to object 0x1008 in String form.

Table 5: Object Configuration For Device Name

INDEX	DATA TYPE	BIT	ACCESS	VALUE	CONTENT
0x1008	STRING	32	RO	R7G4JECT-LC2-A	Model number

■ Manufacturer Hardware Version (0x1009)

The hardware version of this unit is allocated to object 0x1009 in String form.
The format of version is “n.nn.”

Table 6: Object Configuration For Hardware Version

INDEX	DATA TYPE	BIT	ACCESS	VALUE	CONTENT
0x1009	STRING	32	RO	n.nn	Hardware version

■ Manufacturer Software Version (0x100A)

The software version of this unit is allocated to object 0x100A in String form.
The format of version is “n.nn.”

Table 7: Object Configuration For Software Version

INDEX	DATA TYPE	BIT	ACCESS	VALUE	CONTENT
0x100A	STRING	32	RO	n.nn	Software version

■ Identity Object (Vendor information: 0x1018)

Vendor information is allocated to object 0x1018.
While the vendor ID and product code are fixed, the revision number is incremented by one at each major version up of the software.
A unique serial number is allocated to each product.
A serial number consists of 8 digits, starting with two alpha-numeral characters followed by six numeral characters.
The serial number is expressed as 32-bit data divided into 6-bit, 6-bit, and 20-bit groups, with the first two characters converted into 6-bit values.

6 BITS	6 BITS	20 BITS
1st digit	2nd digit	3rd to 8th digits (000000 to 999999)

CHARACTER	VALUE
0	0
1	1
:	:
9	9
A	10
B	11
:	:
Z	35

Table 8: Object Configuration For Vendor Information

INDEX	SUB-INDEX	DATA TYPE	BIT	ACCESS	VALUE	CONTENT
0x1018	0	UINT8	8	RO	4	Number of items
	1	UINT32	32	RO	0x0000060C	Vendor ID
	2	UINT32	32	RO	0x523700A1	Product code
	3	UINT32	32	RO	n	Revision number
	4	UINT32	32	RO	0 to n	Serial number

■ PDO Mapping Objects (Data List: 0x1600, 0x1A00)

Output data list (RxPDO) and Input data list (TxPDO) are allocated to 0x1600 and 0x1A00, respectively.

In the data of RxPDO and TxPDO, index, sub-index, and the number of bit of each object which is referred to, are stored.
For input data, each object with the address starting with 0x6000 is referred to.
For output data, each object with the address starting with 0x7000 is referred to.

Table 9: Object Configuration For Output Data List (RxPDO) And Input Data List (TxPDO)

INDEX	SUB-INDEX	DATA TYPE	BIT	ACCESS	VALUE	CONTENT
0x1600 (RxPDO)	0	UINT8	8	RO	18	Number of items
	1	UINT32	32	RO	0xaaaabbcc	aaaa: Index for referenced object bb: Sub-Index for referenced object cc: Number of bits for referenced object
	2	UINT32	32	RO		
	:	:	:	:		
	18	UINT32	32	RO		
0x1A00 (TxPDO)	0	UINT8	8	RO	16	Number of items
	1	UINT32	32	RO	0xaaaabbcc	aaaa: Index for referenced object bb: Sub-Index for referenced object cc: Number of bits for referenced object
	2	UINT32	32	RO		
	:	:	:	:		
	16	UINT32	32	RO		

■ Sync Manager Communication Type (0x1C00)

Sync Manager Communication Type is allocated to object 0x1C00 based on the EtherCAT specification.

Table 10: Object Configuration For Sync Manager Communication Type

INDEX	SUB-INDEX	DATA TYPE	BIT	ACCESS	VALUE	CONTENT
0x1C00	0	UINT8	8	RO	4	Number of items
	1	UINT8	8	RO	1	Mailbox Write
	2	UINT8	8	RO	2	Mailbox Read
	3	UINT8	8	RO	3	Process Output Data
	4	UINT8	8	RO	4	Process Input Data

■ Sync Manager2 PDO Assignment (Output: 0x1C12)

Sync Manager2 PDO Assignment is allocated to 0x1C12.
In 0x1C12, the RxPDO list is stored.
The indexes stored in 0x1C12 are placed in the order they are actually transmitted via PDO.

Table 11: Object Configuration For Sync Manager2 PDO Assignment

INDEX	SUB-INDEX	DATA TYPE	BIT	ACCESS	VALUE	CONTENT
0x1C12	0	UINT8	8	RO	1	Number of items
	1	UINT16	16	RO	0x1600	Output data

■ Sync Manager3 PDO Assignment (Input: 0x1C13)

Sync Manager3 PDO Assignment is allocated to 0x1C13.
In 0x1C13, the TxPDO list is stored.
The indexes stored in 0x1C13 are placed in the order they are actually transmitted via PDO.

Table 12: Object Configuration For Sync Manager3 PDO Assignment

INDEX	SUB-INDEX	DATA TYPE	BIT	ACCESS	VALUE	CONTENT
0x1C13	0	UINT8	8	RO	3	Number of items
	1	UINT16	16	RO	0x1A00	Input data, Status data

■ Sync Manager Parameter Objects (0x1C32, 0x1C33)

In R7G4JECT, objects 0x1C32 and 0x1C33 do not exist, as the value of Sync Manager Parameter is fixed.
R7G4JECT supports Free Run mode only as the Sync mode.
Note that Distributed Clock (DC) mode is not supported.

■ Input Area Objects (Input Data Area: 0x6000, 0x6001)

Input data is allocated to object 0x6000.
Status data is allocated to object 0x6001. (Refer to 'I/O DATA DESCRIPTIONS'.)
Setting data (read) is allocated to object 0x6100 and 0x6101.

Table 13: Object Configuration For Input Data Area

INDEX	SUB-INDEX	DATA TYPE	BIT	ACCESS	VALUE	CONTENT
0x6000	0	UINT8	8	RO	5	Number of items
	1	INT16	16	RO	0x0000 – 0xFFFF	Total input data
	2	INT16	16	RO	0x0000 – 0xFFFF	CH0 input data
	3	INT16	16	RO	0x0000 – 0xFFFF	CH1 input data
	4	UINT16	16	RO	0xnnnn	CH0 setting command (readback)
	5	UINT16	16	RO	0xnnnn	CH1 setting command (readback)
0x6001	0	UINT8	8	RO	1	Number of items
	1	UINT16	16	RO	0xnnnn	Status data
0x6100 (CH0) 0x6101 (CH1)	0	UINT16	16	RO	5	Number of items
	1	INT16	16	RO	0x0000 – 0xFFFF	Zero % data
	2	INT16	16	RO	0x0000 – 0xFFFF	Span % data
	3	INT16	16	RO	0x0000 – 0xFFFF	Offset
	4	INT16	16	RO	0x0000 – 0xFFFF	Load coefficient
	5	INT16	16	RO	0x0000 – 0xFFFF	Monitor output

• Total input data

Read the result of CH0 input data + CH1 input data.

• CH0 input data, CH1 input data

Read the input data of each channel.

• CH0 setting command (readback), CH1 setting command (readback)

Readback the setting command set in each channel.

• Status data

Read the status data. (Refer to 'I/O DATA DESCRIPTIONS'.)

• Zero% data, Span% data, Offset, Load coefficient, Monitor output

Read the setting value of each parameter.

■ Output Area Objects (Output Data Area: 0x7000, 0x7001)

Setting command and setting data (write) are allocated to object 0x7000 and 0x7001. (Refer to 'I/O DATA DESCRIPTIONS'.)

Table 14: Object Configuration For Output Data Area

INDEX	SUB-INDEX	DATA TYPE	BIT	ACCESS	VALUE	CONTENT
0x7000 (CH0) 0x7001 (CH1)	0	UINT8	8	RO	6	Number of items
	1	UINT16	16	RW	0xnnnn	Setting command
	2	INT16	16	RW	0x0000 – 0xFFFF	Zero% data
	3	INT16	16	RW	0x0000 – 0xFFFF	Span% data
	4	INT16	16	RW	0x0000 – 0xFFFF	Offset
	5	INT16	16	RW	0x0000 – 0xFFFF	Load coefficient
	6	INT16	16	RW	0x0000 – 0xFFFF	Monitor output

• Setting command

Write the setting command. (Refer to 'I/O DATA DESCRIPTIONS'.)

• Zero% data

By setting the zero% data, user zero adjustment value is calculated depending on the default setting value and written.
Set the value of % × 100. Setting range: -11500 to +11500 (-115.00 to +115.00 %)

• Span% data

By setting the span% data, user span adjustment value is calculated depending on the default setting value and written.
Set the value of % × 100. Setting range: -11500 to +11500 (-115.00 to +115.00 %)

Zero% data and span% data are used for replacing the unit.
With the unit A that was installed initially, adjust the zero point with the sensor in no-load condition and the span point with the sensor in 100% load condition. Then, load the zero% data and span% data.
After replacing with another unit B, set the zero% data and span% data of the unit A with this function. Then, it is possible to operate with the same zero and span adjustment values as unit A without adjusting the zero and span points.

• Offset

Set an arbitrary offset.
Set the value of % × 100. Setting range: -10000 to +10000 (-100.00 to +100.00 %)

• Load coefficient

Set the load coefficient.
Set the value of % × 100. 0x0000 disables the load coefficient setting. Setting range: 1000 to 10000 (10.00 to 100.00 %)

• Monitor output

Set the data that outputs during the monitor mode.
Set the value of % × 100. Setting range: -11500 to +11500 (-115.00 to +115.00 %)

■ Configuration Area Objects (Configuration data: 0x8000 - 0x8001, 0x8100)

Configuration data is allocated to object 0x8000 - 0x8001, 0x8100.
Lowpass filter and excitation voltage channel are common.

Table 15: Object Configuration For Configuration Data

INDEX	SUB-INDEX	DATA TYPE	BIT	ACCESS	VALUE	CONTENT
0x8000 (CH0) 0x8001 (CH1)	0x00	UINT16	16	RO	2	Number of items
	0x01	UINT16	16	RW	0xnnnn	Setting command
	0x02	UINT16	16	RW	0: 2 times, 1: 4 times, 2: 8 times, 3: 16 times, 4: 32 times, 5: 64 times, 6: 128 times, 7: 256 times, 8: 512 times, 9: 1024 times	Moving average
0x8100 (Common channel)	0x00	UINT16	16	RO	2	Number of items
	0x01	UINT16	16	RW	0: 2 Hz, 1: 2 kHz (1 Hz)	Lowpass filter
	0x02	UINT16	16	RW	0: 2.5 V, 1: 5 V	Excitation voltage

• Moving average

Set the average count of input data.
Moving average count setting value:
0: 2 times, 1: 4 times, 2: 8 times, 3: 16 times, 4: 32 times, 5: 64 times, 6: 128 times, 7: 256 times, 8: 512 times, 9: 1024 times

• Lowpass filter

Set the lowpass filter of input to 2 Hz or 2 kHz.
Lowpass filter setting value: 0 (2 Hz)
1 (2 kHz when the option is /F2K. 1 Hz when the option is /F1.)

• Excitation voltage

Set the excitation voltage of input to 5V or 2.5V.
Excitation voltage setting value: 0 (2.5 V)
1 (5 V)

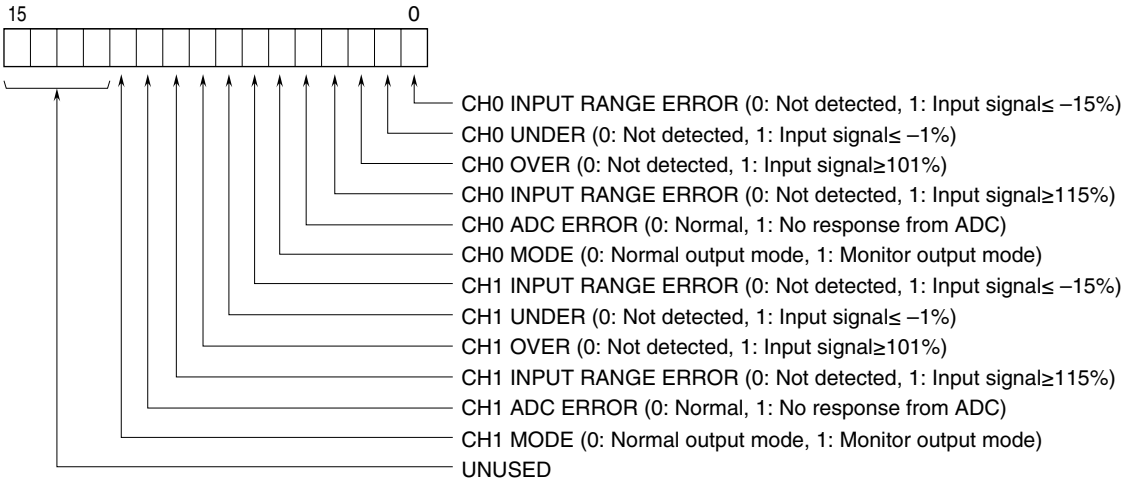
I/O DATA DESCRIPTIONS

■ **Analog I/O module**

• Input Area Objects/Output Area Objects

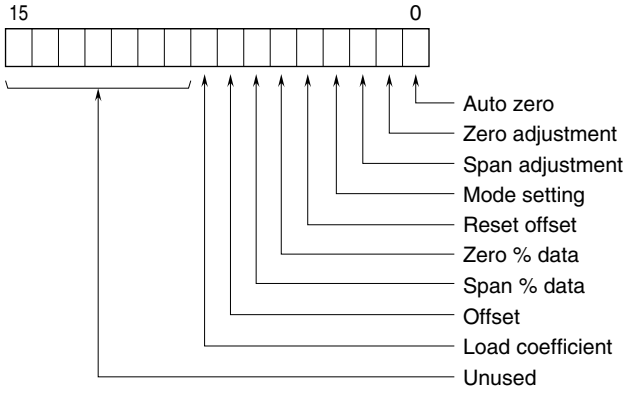
16-bit binary data.
Negative range is represented in 2's complement.

■ **Status**



■ **LC2 setting command**

• Common with Output Area Objects, Configuration Area Objects



• AUTO ZERO

Offset the input to '0'. Perform the auto zero setting after finishing zero and span adjustment. Follow the instruction below.
Set the sensor to the input state you want to give an offset.
Set the auto zero bit to '1'. After completing offset, A. ZERO LED is turned on.
After completing, set the auto zero bit to "0".

• ZERO ADJUSTMENT

Adjust the zero of input. Follow the instruction below.
Apply 0% load to the sensor.
Set the zero adjustment bit to '1'. After completing adjustment, ZERO LED is turned on.
After completing, set the zero adjustment bit to "0".

• SPAN ADJUSTMENT (ACTUAL LOAD ADJUSTMENT)

Adjust the span. Follow the instruction below.
Apply 100% load to the sensor.
Set the span adjustment bit to '1'. After completing adjustment, SPAN LED is turned on.
After completing, set the span adjustment bit to '0'.

• MODE SETTING

Choose measurement mode or monitor output mode.

- Measurement Mode
  Set mode setting bit to '0' to change to measurement mode. In measurement mode, monitor output operates simultaneously with input data.
- Monitor Output Mode
  Set mode setting bit to '1' to change to monitor output mode. In monitor output mode, it outputs the value of setting data area for each input when starting the mode setting bit. The value set at setting data area is displayed in input data area. Input is disabled. The procedure to set input 1 to 20% monitor output is shown below.

1) Set setting data area of input to the scaling value that corresponds to 20% (scaling value setting: 2000 in case of 0 to 10000).
2) Set the mode setting bit to '1'. After completing the setting, MODE LED is turned on, monitor output terminal outputs the equivalent value to 20.00%.
3) After confirming the output, set the mode setting bit to '0' to return to measurement mode.

• RESET OFFSET

Offset value set by auto zero is cleared to '0'. Follow the instruction below.
1) Set reset offset bit to '1'. After completing clear to '0', RESET LED is turned on.
2) After completing, set the auto zero bit to '0'.

• ZERO% DATA

Write zero% data set with zero% data setting (0x7000: 02, 0x7001: 02). Follow the instruction below.
1) Set any value to zero% data (0x7000: 02, 0x7001: 02).
2) Set '1' to zero% data bit.
3) After completing, set '0' to zero% data bit.

• SPAN% DATA

Write span% data set with span% data setting (0x7000: 03, 0x7001: 03). Follow the instruction below.
1) Set any value to span% data (0x7000: 03, 0x7001: 03).
2) Set '1' to span% data bit.
3) After completing, set '0' to span% data bit.

• OFFSET

Write offset set with offset setting (0x7000: 04, 0x7001: 04). Follow the instruction below.
1) Set any value to offset (0x7000: 04, 0x7001: 04).
2) Set '1' to offset bit.
3) After completing, set '0' to offset bit.

• LOAD COEFFICIENT

Setting load coefficient enables to adjust without 100% actual load. Follow the instruction to set 20% load below.
1) Apply 20% load to the sensor.
2) Set the scaling value that corresponds to 20% to load coefficient (0x7000: 05, 0x7001: 05). (scaling value setting: 2000 in case of 0 to 10000).
3) Set the span adjustment bit to '1'. After completing adjustment, SPAN LED is turned on.
4) After completing, set the span adjustment bit to '0'.