

# RYS8830

# RYS8833

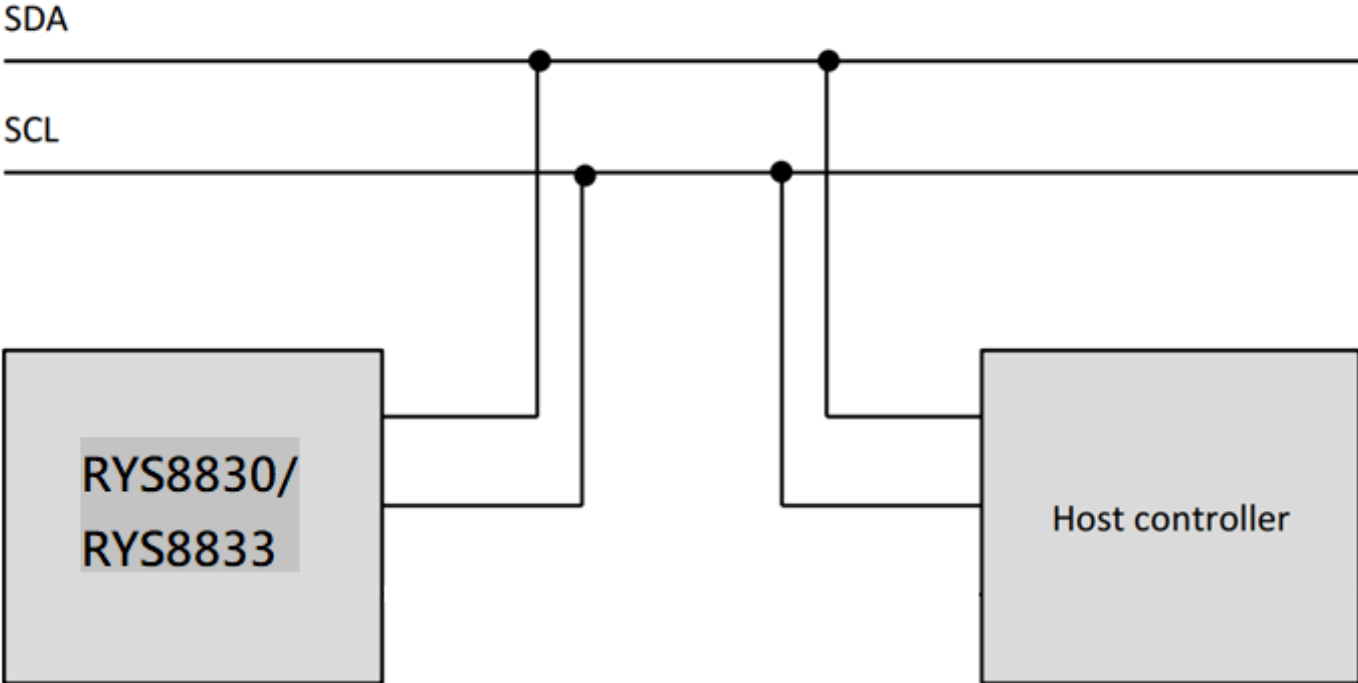
## I2C Interface Software Guide



# 1.1 I<sup>2</sup>C interface

The RYS8830/RYS8833 is operated as I2C slave device. The settings of the I2C interface are listed below.

- 1.) I2C clock frequency : 400kHz
- 2.) Address length : 7 bits
- 3.) Slave address : 0x24



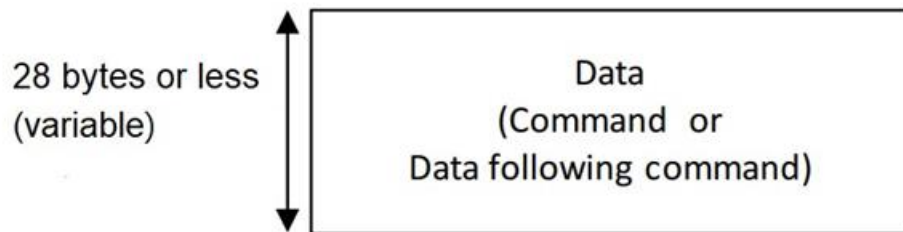
## 1.2 The structure of data from host controller

The data that is sent from host controller is either:

- 1.) Command, or
- 2.) Data associated with command

They are called “data attribute”.

When sending data with I2C, the entire data is being divided into the packet(s) which size is 28 bytes or less. The host controller must wait over 2ms every time sending one packets. One packet shall include one “data attribute”.



The structure of data from host controller

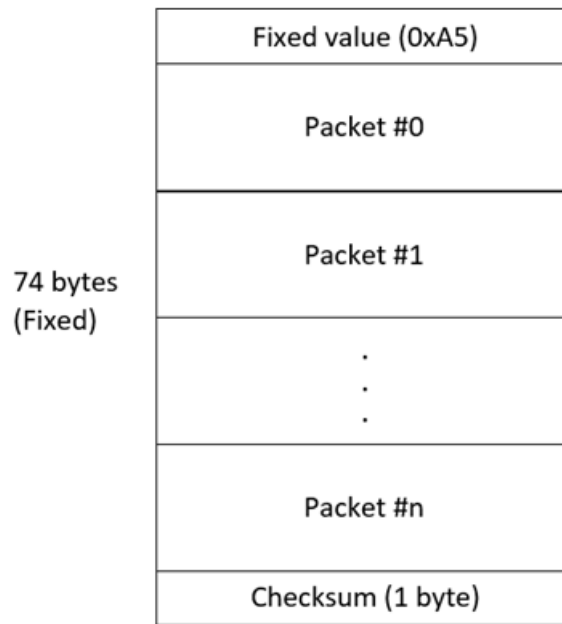
## 1.3 The structure of data from RYS8830/RYS8833

The data that is sent from RYS8830/RYS8833 is either:

- 1.) Command responses
- 2.) Data following commands
- 3.) NMEA sentences

They are called “data attribute”.

The data length that is sent in one I2C transaction is 74 bytes (fixed value). It includes more than one packet of any attributes. Below is the structure of 74 bytes data from RYS8830/RYS8833.



The structure of data from RYS8830/RYS8833

Each data chunk is followed by the preamble data (0xA5). The packet type is described at the top of each packet. Data size is determined by the packet type. When the packet type is 0x0F, data size field is inserted to accommodate variable data size.

Table 1. The type of packets

	Contents	Data size
0x00-0x04	Reserved	
0x0F	Command response, data following commands, NMEA sentence	Variable (described in data size field)

The structures of each packet types are below:

Packet type (1byte)
Data size (1 byte)
Command response, data following command, NMEA sentence (variable)

Packet type: 0x0F

### The structure of the packet of each packet type

Any type, any number of packets is included in one transaction data (74 bytes) . Command (specified at “Command specification” section) / data following command (specified at “Command specification” section) /NMEA sentence (specified at “NMEA sentences” section) are stored in the packet of packet type=0x0F. These data are divided if needed and sent by more than one transaction.

If the total data size which is transmitted from RYS8830/RYS8833 is less than 74bytes, Dummy data is added to 74 bytes of remaining area.

The host must retrieve data in a timely manner or the data may be lost. Please design the host controller’s system with consideration for enough bandwidth. When host controller receives the sensor data with high frequency, please do the transmission and reception alternately.

Checksum for whole of the data is added at the end of data. Checksum is the lower 1 byte of the 1’s complement of the sum for whole of the data (74 bytes, excluding checksum itself)