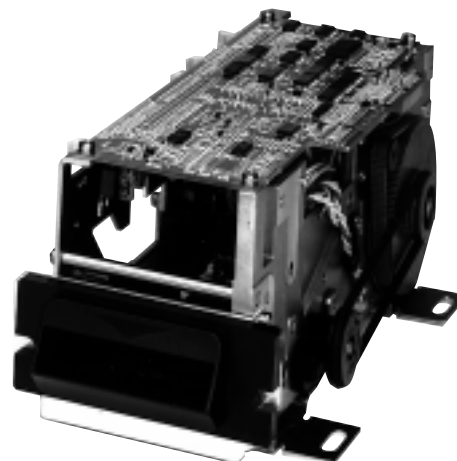


## Motor Driven Card Reader/Writer

3S4YR-MKW, MKF, MKS

### Versatile Hybrid Reader/Writer Handles Both Magnetic and IC Cards

- Durable 4-wheel, 2-belt drive with roller accommodates discrepancies in card thickness to accept warped or bent cards
- Ideal for open systems
- Compact size and light weight allow easy installation in any terminal
- Software-driven read/write function allows recognition of any type of ISO track
- Three integrated chip station positions available (X, J, B)
- Adjustable to card thicknesses of 0.20 mm, 0.40 mm, and 0.76 mm (PET, paper, or PVC cards)
- HiCo write capability available



### Ordering Information

| Magnetic Tracks Supported (R, R/W) |     |     |        |        | IC Contact                          | Shutter | Interface      | Color | Part Number                           |
|------------------------------------|-----|-----|--------|--------|-------------------------------------|---------|----------------|-------|---------------------------------------|
| 1                                  | 2   | 3   | Center | JIS II |                                     |         |                |       |                                       |
| R/W                                | R/W | R/W | —      | —      | J-type(ISO) <sup>(See note 1)</sup> | Yes     | TTL-compatible | Black | 3S4YR-MKW1JD                          |
| R/W                                | R/W | R/W | —      | —      | X-type(ISO+CP8)                     | Yes     | TTL-compatible | Black | 3S4YR-MKW1XD                          |
| R/W                                | R/W | R/W | —      | —      | Upgradeable                         | Option  | TTL-compatible | Black | 3S4YR-MKW1PC                          |
| R/W                                | R/W | R/W | —      | —      | Upgradeable                         | Option  | TTL-compatible | Black | 3S4YR-MKW1PCH <sup>(See note 2)</sup> |
| R/W                                | R/W | R/W | —      | —      | Upgradeable                         | Yes     | TTL-compatible | Black | 3S4YR-MKW1PD                          |
| R/W                                | —   | —   | —      | —      | Upgradeable                         | Option  | TTL-compatible | Black | 3S4YR-MKW3PC                          |
| —                                  | R/W | —   | —      | —      | Upgradeable                         | Option  | TTL-compatible | Black | 3S4YR-MKW4PC                          |
| —                                  | R/W | —   | —      | —      | Upgradeable                         | Option  | TTL-compatible | Black | 3S4YR-MKW4PCH <sup>(See note 2)</sup> |
| —                                  | R/W | —   | —      | —      | Upgradeable                         | Yes     | TTL-compatible | Black | 3S4YR-MKW4PD                          |
| —                                  | —   | R/W | —      | —      | Upgradeable                         | Option  | TTL-compatible | Black | 3S4YR-MKW5PC                          |
| R/W                                | R/W | —   | —      | —      | Upgradeable                         | Option  | TTL-compatible | Black | 3S4YR-MKW6PC                          |
| —                                  | R/W | R/W | —      | —      | Upgradeable                         | Option  | TTL-compatible | Black | 3S4YR-MKW7PC                          |
| —                                  | R/W | R/W | —      | —      | Upgradeable                         | Yes     | TTL-compatible | Black | 3S4YR-MKW7PD                          |
| R/W                                | R/W | R/W | —      | —      | Upgradeable                         | Option  | RS-232C        | Black | 3S4YR-MKFW1PC <sup>(See note 3)</sup> |
| R/W                                | R/W | R/W | —      | —      | Upgradeable                         | Yes     | RS-232C        | Black | 3S4YR-MKFW1PD <sup>(See note 3)</sup> |
|                                    |     |     |        |        |                                     |         |                |       |                                       |
|                                    |     |     |        |        |                                     |         |                |       |                                       |

Note 1: Consult the *IC-Card Basics* section of this catalog for IC contact descriptions.

2: MKW1PCH and MKW4PCH are capable of writing HiCo cards. All models can read HiCo cards.

3: RS-232C supports card control and magnetic reading/writing. IC support requires customer-designed interface board.

## ■ TYPICAL APPLICATIONS

- Cash Dispensers
- Automatic Teller Machines (ATM)
- POS Terminals
- Credit Card Checkers
- ID Card Checkers
- Electronic Lock Systems
- Medical Patient Systems
- Health Control Systems

## ■ ACCESSORIES

| Description                                                                  | Part Number                        |
|------------------------------------------------------------------------------|------------------------------------|
| IC Card on the front, lower position                                         | <b>IC CONTACT J</b> (See note 1)   |
| IC Card on the front, upper position                                         | <b>IC CONTACT B</b> (See note 1)   |
| IC Card on the front, upper and lower positions                              | <b>IC CONTACT X</b> (See note 1)   |
| Shutter for MKW1PC, MKW1PCH, MKFW1PC                                         | <b>SHUTTER MKD1</b>                |
| Shutter for MKW3PC                                                           | <b>SHUTTER MK3</b>                 |
| Shutter for MKW4PC, MKW4PCH                                                  | <b>SHUTTER MK4</b>                 |
| Shutter for MKW5PC                                                           | <b>SHUTTER MK5</b>                 |
| Shutter for MKW6PC                                                           | <b>SHUTTER MK6</b>                 |
| Shutter for MKW7PC                                                           | <b>SHUTTER MK7</b>                 |
| MM Sensor Holder (MM sensor itself must be purchased from the manufacturer.) | <b>MM HOLDER</b>                   |
| Watermark Reader Head. Cannot be used to write track 1.                      | <b>WATERMARK HEAD</b> (See note 2) |
| Watermark Circuit Board. Cannot be used to write track 1.                    | <b>WATERMARK PCB</b> (See note 2)  |

Note 1: Consult your Omron sales representative for IC contact accessories. Special configurations can be supplied.

2: Watermark Reader Head and Watermark Circuit Board must be ordered together.

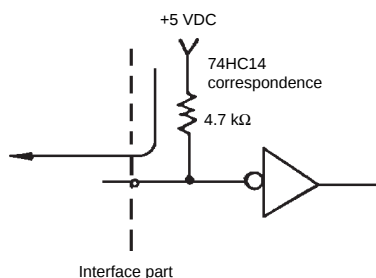
## Specifications

|                         |                 |                                                                              |
|-------------------------|-----------------|------------------------------------------------------------------------------|
| Part number             |                 | 3S4YR-MKW, MKF, MKS                                                          |
| Recommended card type   | Magnetic card   | ISO 7810-7813                                                                |
|                         | IC card         | ISO 7816/1, 2                                                                |
| Recording method        |                 | FM decoding (F2F)                                                            |
| Card feeding speed      |                 | 20 cm/sec $\pm$ 10% (7.87 in/sec)                                            |
| Motor type              |                 | DC motor                                                                     |
| Service life (See note) |                 | 1,200,000 passes min.                                                        |
| Operating power supply  | Amplifier       | 24 VDC $\pm$ 10%                                                             |
|                         | Motor           | 24 VDC $\pm$ 10%                                                             |
|                         | Control logic   | 5 VDC $\pm$ 5%                                                               |
| Current consumption     | Amplifier       | 260 mA max.                                                                  |
|                         | Motor           | 1.7 A max.                                                                   |
|                         | Control logic   | 330 mA max.                                                                  |
| Mounting location       |                 | Anywhere not directly subject to water or rain                               |
| Mounting orientation    |                 | Stripe top or stripe bottom                                                  |
| Ambient temperature     | Operation       | -5° to 55°C (23° to 131°F)                                                   |
|                         | Storage         | -25° to 70°C (-13° to 158°F)                                                 |
| Ambient humidity        | Operation       | 45% to 85% RH without condensation                                           |
|                         | Storage         | 30% to 90% RH                                                                |
| Vibration               |                 | 10 to 55 Hz, 2 mm double amplitude, for 30 minutes in X, Y, and Z directions |
| Shock                   |                 | 300 m/sec <sup>2</sup> (30 G) in each of X, Y, and Z directions              |
| Dimensions              | With shutter    | 247L x 106W x 92H mm (9.72L x 4.17W x 3.62H in)                              |
|                         | Without shutter | 222L x 98W x 92H mm (8.74L x 3.86W x 3.62H in)                               |
| Weight                  |                 | Approx. 1.9 kg (4.2 lbs) when fully equipped                                 |

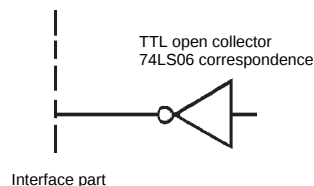
Note: One pass denotes one round trip.

# Engineering Data

## INPUT CIRCUIT DIAGRAM



## OUTPUT CIRCUIT DIAGRAM



## I/O INFORMATION

### 3S4YR-MKW Connector of Magnetic Card (CN1 Signal)

3M 3433-5302JL. Mate: 3M 3425-6550EL.

| Pin # | Signal            | Input/Output | Pin # | Signal            | Input/Output |
|-------|-------------------|--------------|-------|-------------------|--------------|
| 1     | +5 VDC            | —            | 26    | $\overline{S1}$   | Output       |
| 2     | +5 VDC            | —            | 27    | $\overline{S2}$   | Output       |
| 3     | 0 V               | —            | 28    | $\overline{S3}$   | Output       |
| 4     | 0 V               | —            | 29    | $\overline{S4}$   | Output       |
| 5     | P24V              | —            | 30    | $\overline{STW}$  | Output       |
| 6     | P24V              | —            | 31    | $\overline{RCP1}$ | Output       |
| 7     | P0V               | —            | 32    | $\overline{RDP1}$ | Output       |
| 8     | P0V               | —            | 33    | $\overline{RCP2}$ | Output       |
| 9     | $\overline{MFW}$  | Input        | 34    | $\overline{RDP2}$ | Output       |
| 10    | $\overline{MRV}$  | Input        | 35    | $\overline{RCP3}$ | Output       |
| 11    | $\overline{SOL1}$ | Input        | 36    | $\overline{RDP3}$ | Output       |
| 12    | —                 | —            | 37    | $\overline{RCP4}$ | Output       |
| 13    | —                 | —            | 38    | $\overline{RDP4}$ | Output       |
| 14    | —                 | —            | 39    | $\overline{WCP1}$ | Output       |
| 15    | —                 | —            | 40    | $\overline{WCP2}$ | Output       |
| 16    | —                 | —            | 41    | $\overline{WDT1}$ | Input        |
| 17    | $\overline{WEN}$  | Input        | 42    | $\overline{CNT1}$ | Input        |
| 18    | —                 | —            | 43    | $\overline{WDT2}$ | Input        |
| 19    | $\overline{RCPS}$ | —            | 44    | $\overline{CNT2}$ | Input        |
| 20    | $\overline{RDP5}$ | —            | 45    | $\overline{WDT3}$ | Input        |
| 21    | $\overline{SHD1}$ | Output       | 46    | $\overline{CNT3}$ | Input        |
| 22    | $\overline{WDV}$  | Output       | 47    | $\overline{WDT4}$ | Input        |
| 23    | $\overline{SHE}$  | Output       | 48    | $\overline{CNT4}$ | Input        |
| 24    | $\overline{WID}$  | Output       | 49    | +24 VDC           | —            |
| 25    | $\overline{S0}$   | Output       | 50    | +24 VDC           | —            |

### 3S4YR-MKW Connector of IC Card (CN2 Signal)

3M 3408-5302JL. Mate: 3M 3452-6516EL.

| Pin # | Signal | Input/Output | Pin # | Signal            | Input/Output |
|-------|--------|--------------|-------|-------------------|--------------|
| 1     | IVCC   | ◆            | 9     | IRS1              | ◆            |
| 2     | IRST   | ◆            | 10    | IRS2              | ◆            |
| 3     | ICIO   | ◆            | 11    | $\overline{IECO}$ | Input        |
| 4     | IGND   | ◆            | 12    | —                 | —            |
| 5     | —      | —            | 13    | $\overline{IMSL}$ | Input        |
| 6     | ICKL   | ◆            | 14    | $\overline{ISOL}$ | Input        |
| 7     | IVCC   | ◆            | 15    | +5 VDC            | —            |
| 8     | IVPP   | ◆            | 16    | 0 V               | —            |

◆ = Direct IC Contact

## I/O INFORMATION, continued

### 3S4YR-MKF (RS-232C Adaptor)

Modular Jack, Hirose TM3RA-88.

Recommended mating connector: TM8P-88P.

| Pin # | Signal        | Input/Output | Pin # | Signal       | Input/Output |
|-------|---------------|--------------|-------|--------------|--------------|
| 1     | DSR           | Input        | 5     | RTS          | Output       |
| 2     | Signal Ground | —            | 6     | RXD          | Input        |
| 3     | DTR           | Output       | 7     | TXD          | Output       |
| 4     | CTS           | Input        | 8     | Frame Ground | —            |

### 3S4YR-MKF (Power Connector)

Molex 5046-04A. Recommended mating

connector: Molex 5102-04 or 5050-04.

| Pin # | Signal |
|-------|--------|
| 1     | X24V   |
| 2     | XGND   |
| 3     | GNB    |
| 4     | +24V   |

### 3S4YR-MKF (Chip Card Adaptor)

HIF3FC-26PA-254DS (Hirose Electric Co. Japan)

2.54 mm pitch, double row (Conforming to MIL-C-83503)

Recommended mating connector: any type conforming to the MIL-C-83503.

| Pin # | Signal                    | Input/Output | Pin # | Signal                     | Input/Output |
|-------|---------------------------|--------------|-------|----------------------------|--------------|
| 1     | X24V                      | —            | 14    | ICI0                       | ◆            |
| 2     | NC                        | —            | 15    | IRS1                       | ◆            |
| 3     | NC                        | —            | 16    | $\overline{\text{IECO}}$   | Output       |
| 4     | +5V                       | —            | 17    | IDI0                       | Input/Output |
| 5     | $\overline{\text{CENB}}$  | Output       | 18    | $\overline{\text{IRSTEN}}$ | Output       |
| 6     | 0V                        | —            | 19    | $\overline{\text{IATR}}$   | Output       |
| 7     | $\overline{\text{PDWN}}$  | Output       | 20    | $\overline{\text{X0R1}}$   | Output       |
| 8     | ICLK                      | ◆            | 21    | $\overline{\text{X0R2}}$   | Output       |
| 9     | $\overline{\text{IEMRG}}$ | Input        | 22    | $\overline{\text{X0R3}}$   | Output       |
| 10    | IVCC                      | ◆            | 23    | $\overline{\text{X0R4}}$   | Output       |
| 11    | IRST                      | ◆            | 24    | 0V                         | —            |
| 12    | IGND                      | ◆            | 25    | $\overline{\text{RESET}}$  | Output       |
| 13    | IVPP                      | ◆            | 26    | IRS2                       | ◆            |

◆ = Direct IC Contact

### 3S4YR-MKS

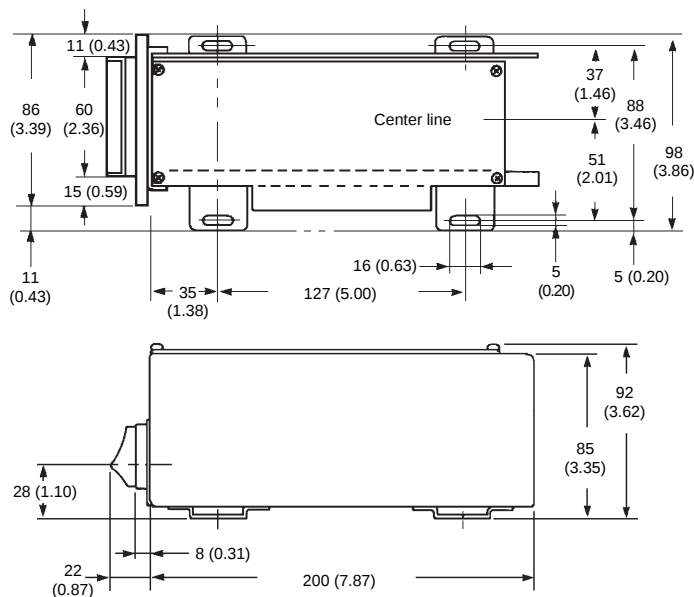
Connector: Hirose HDBB-25S.

| Pin # | Signal | Input/Output |
|-------|--------|--------------|
| 1     | FG     | —            |
| 2     | TXD    | —            |
| 3     | RXD    | —            |
| 4     | RTS    | —            |
| 5     | CTS    | —            |
| 6     | DSR    | —            |
| 7     | GND    | —            |
| 20    | DTR    | —            |

## Dimensions

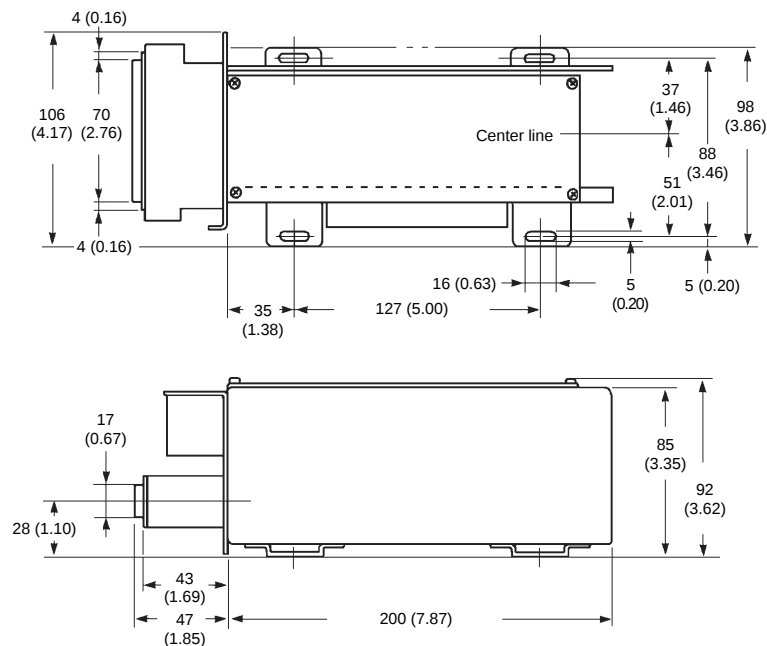
Unit: mm (inch)

### 3S4YR-MKW WITHOUT SHUTTER



Stripe down shown.  
Can be mounted with  
stripe up.

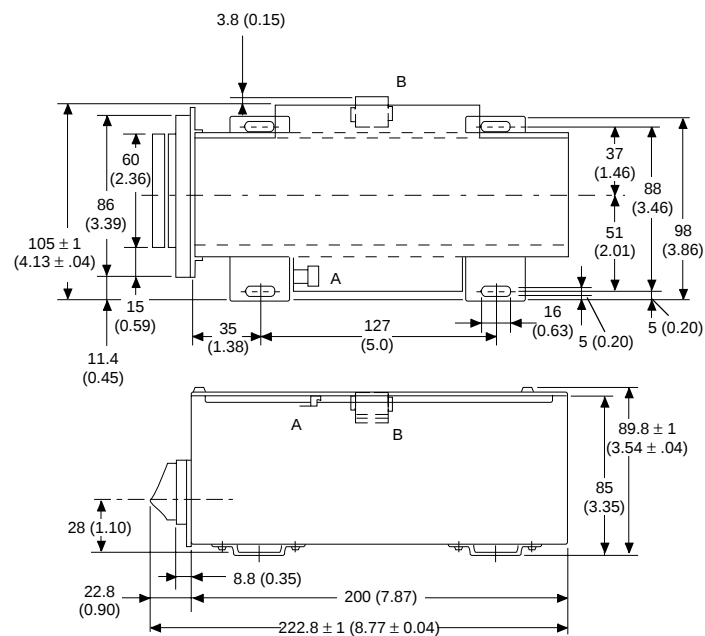
### ■ 3S4YR-MKW WITH SHUTTER



Stripe down shown.  
Can be mounted with  
stripe up.

Note: Unless otherwise specified, tolerance is  $\pm 0.3$ .

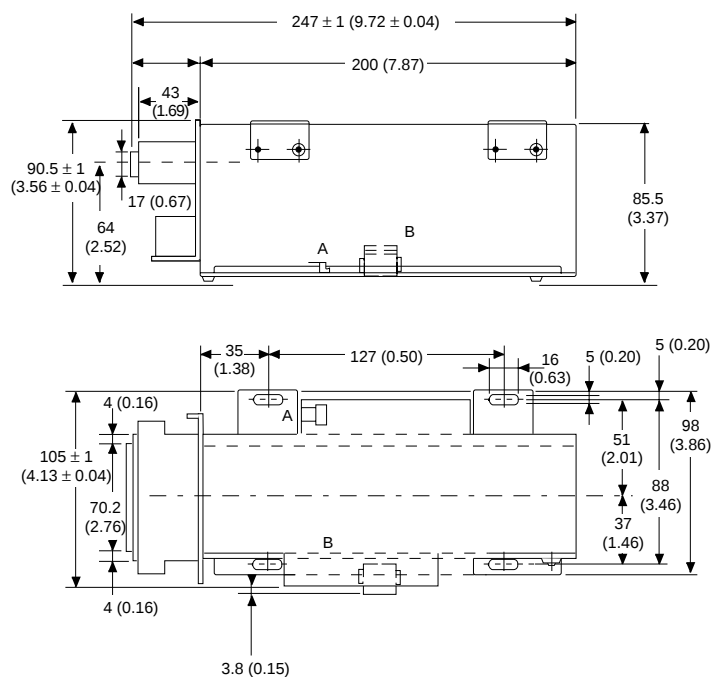
### ■ 3S4YR-MKF WITHOUT SHUTTER



Stripe down shown.  
Can be mounted with  
stripe up.

Unit: mm (inch)

# ■ 3S4YR-MKF WITH SHUTTER



Stripe up shown.  
Can be mounted with  
stripe down.

# ■ 3S4YR-MKS

