

Verid[®] Fingerprint Reader

TSSI's Verid fingerprint reader provides access control systems with instant improved security. Installed between the existing PIN entry device and the door controller Verid confirms the presence of the correct person. No changes are needed to the cards, PIN entry devices or access control system software. The complete verification process and database are all held within the single wall mounted housing which contains fixing terminals for the data cables. Two versions of the reader are available, a verification only unit and an enrollment unit.

Verification Unit

Uses LED's only to guide the user through the verification process.

■ Mode of Operation

The Verid verification unit accepts a PIN from a PIN entry device. A comparison is then made between the template from the live finger and the original template associated with the PIN. Templates can be stored in Verid or on track 3 of a magnetic card. If the templates match, Verid outputs the PIN data. PINs and templates are loaded via the integral RS232 or RS485 ports.



Enrollment Unit

In addition to the LEDs, enrollment units have an integral LCD display and control keys. These units enable new users to be enrolled onto the system.

■ Mode of operation

The enrollment unit performs all the functions of the verification unit with the added capability of enrolling, updating and deleting users from its internal database. This information can then be extracted via the RS232 port and transferred to other Verid verification or enrollment units. Automatic transfer of templates is available via the integral RS485 network connection.

Configuration

Verid is supplied in a standard configuration with:

Input	- Magtek track 2 timing
Output	- Magtek track 2 timing
LED control	- Internal
Database	- Internal
CardPresent	- Not set
TimeOut	- Not set

These settings can be altered by sending commands via the RS232 port. The detailed command set is contained in the full Verid manual. Alternatively the configuration can be set using the "Verid Manager" PC software kit, available from TSSI. (Requires a PC running Windows 95 or later)

PIN Input Devices

All PIN input devices are connected to Verid through the terminal block on the inside of the back panel. Verid supports a wide range of standard inputs:

■ ISO Track 2 - Magtek or Omron timing

Requires Strobe and Data signals. Option of TimeOut and CardPresent.

ISO Track 2 - PIN Format

Data must conform to ISO7811 "track 2" format. Max PIN length is 16 characters (excluding start/end sentinels). If more than 16 characters are sent, Verid will truncate it and use the first 16 characters as the PIN.

- Watermark Magnetics
Requires Strobe and Data signals.
Option of TimeOut and CardPresent.

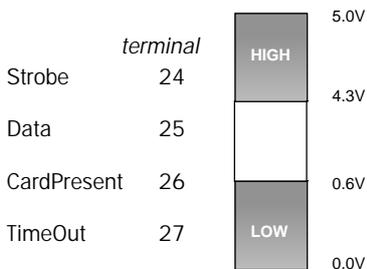
Watermark - PIN Format
Supports all registered LRC, or non-LRC, Watermark formats.

- **Wiegand:**
Requires Wiegand '0' and Wiegand '1' signals.
Option of TimeOut and CardPresent if available.
Wiegand - PIN Format
Card data must conform to either:
 - Wiegand 2601 standard or
 - "General Wiegand" – i.e. from a reader which **always** outputs the data in the **same direction**.

- *PIN Keypad (up to 4x4)*
Each key must have a row and column location assigned to it.

PIN Format
PIN lengths can be set between 1 and 16 digits. The factory default is 4.

Input Terminal Connections



Data Output

After a successful template match the **PIN data only** is sent from Verid. With the exception of a PIN pad, the data is output in the same format as it is received from the PIN entry device. PIN pad data is output in ISO track 2 format with either Magtek or Omron timing.

Output Terminal Connections

Strobe	- terminal 31
Data	- terminal 32
CardPresent	- terminal 33
TimeOut	- terminal 34

Error Codes Output

If the finger fails to match the template, the PIN data output is:

PIN device:	Error Code:
Weigand 2601:	26 bit, data: "000000"
ISO Track 2:	ISO card with data: "000000"
General Weigand:	26 bit, data: "000000"
Watermark:	Registered Watermark card, data: "000000"

Template Management

Verid supports three methods for managing templates – transfer via RS232, or RS485 and storage of templates on track 3 of a standard magnetic card.

- *RS485 / Network template transfer.*

Once installed, the dedicated 485 network will automatically transfer information on newly enrolled, deleted or updated templates. Adding new units into the network is also made easy with all new units automatically adopting the configuration of the other units on the network. The network architecture is a linear twisted pair, terminated with 120 ohm resistors, with no spurs.

- *Template on track 3 of mag card.*

The fingerprint template can be stored on track 3 of a magnetic card rather than in the Verid unit itself. Verid must be configured to accept template entry by this method, and the card used must also contain PIN data on track 2. Configuration is possible via the RS232 port using Verid Manager.

RS232 Interface

The 3.5mm jack connector on the underside of the unit provides RS232 communications. Verid Manager, from TSSI, offers a variety of template management options including capturing or writing the complete database, capturing or writing individual records and storing records in a PC for backup or transfer to other units. More details are available in the document "Verid Manager User Guide".

- *RS232 Communication Protocol*

Characters are sent at 19,200 baud

Handshaking is not provided and the character format is:

Start Bits	1
Data Bits	8
Parity Bits	None
Stop Bits	1

- *Message Format*

Communication between the reader and PC uses the following frame format in both directions:

Header, Length, Identifier, Data, CRC

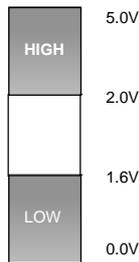
- Header - a sequence of four bytes indicating the start of a message. They are: 76, 9A, 4D and C6 hex.
- Length - two bytes which define the number of bytes following the length field.
- Identifier - a single byte which indicates the type of message.
- Data - a data field (where required) and can be of variable length dependent on the message being sent.
- CRC - two bytes covering the Identifier and Data fields.

User Interface

All Verid units have six LEDs to indicate the status of the unit and guide the individual through the verification process (see diagram). In the standard configuration all the LEDs are controlled by the Verid unit, but an option is available for the tristate Go/NoGo LED to be controlled by the host system.

The external system controls the LED with two lines which are driven by 5V logic levels:-

High 2V - 5V
Low 0V - 1.6V

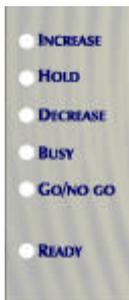


Inputs are high impedance with 100kΩ pull up resistors.

		Terminal 2	
		Low	High
Term	Low	Amber	Red
3	High	Green	Off

LED control connections:

0V terminal 1
line 1 terminal 2
line 2 terminal 3



Place finger - press harder
Hold finger in position
Remove finger
Processing data
{ Green - match OK
{ Flash red - match failed
Power on

Enrollment units also have an LCD display and four keys to enable selection of the appropriate function during the enrollment process. The LCD display can be programmed via the RS232 port using Verid Manager to display alternative languages, including languages requiring double byte character sets.

Power up – LED “show”

When the unit is powered up, the LEDs will initially cycle through a sequence to determine the network and configuration status. This is described in detail in the Verid User Manual. Once completed, some of the LEDs may stay illuminated, to indicate network status. The LEDs will be cleared once the first PIN is received.

Number of users

Each Verid unit can store templates on up to 5000 users. Each of the 5000 users can have either one or two fingers registered.

Security Levels - Verid

Each Verid unit can be set into one of 7 security levels:

“Levels 1 to 5 (strictest)” check the fingerprint to differing degrees of accuracy.

Additionally, Verid can be set to “PIN only” (i.e. no fingerprint checking) and “Any fingerprint” (i.e. the user places a finger on the unit which is then apparently checked, but will always pass).

Security Levels - Users

During the enrollment of each user (and SuperUser), a security level can be assigned to that user. The levels that can be assigned to that user are:

“Global setting”: The user will adopt the security setting of the Verid unit.

“Levels 1 to 5 (strictest)” check the fingerprint to differing degrees of accuracy.

“Any fingerprint” and “PIN Input Only” can also be assigned to the user.

A user's individual security level will override the global level set on the Verid unit being used.

Network functions

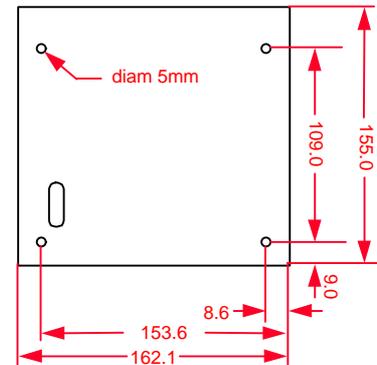
If a network of Verid units is set up, the following tasks will take place automatically – normally without any PC or user intervention:

- Any users added, deleted or updated will immediately be broadcast to all other Verid units on the network.
- Any new units added to the network will adopt the configuration (e.g. PIN device and messages) of the other units on the network.
- Network address information will be resolved by the Verid units on the network to avoid duplicate network IDs.

Installation

Fixing Details

Attach the backplate to the wall using the four fixing holes provided (see diagram). Note a gap of 3mm must be left between the fixing plate and any adjacent object to accommodate the housing. Connect all system wiring to the screw terminals before



All dimensions in mm

connecting the ribbon cable from the Verid unit to the terminal plate. Insert the top of the housing over the back plate and fasten using the two bolts on the base of the unit. For maximum security we recommend the use of anti-tamper bolts (size M4 (metric)).

Installation

All connections are made via the interface PCB mounted on the rear plate:

Terminal No		Terminal No.	
1	0V (for LED control)	18	Power supply input: 0V
2	Input - LED1 control	19	Power supply input: +12V
3	Input - LED2 control	20	Output to external device: 0V
		21	Output to external device: +5V
4	0V	22	Output to external device: +12V
5	Reserved		
6	Reserved	23	0V (for PIN inputs)
7	RS485 - B	24	Input from PIN - Strobe or Wiegand '0'
8	RS485 - A	25	Input from PIN - Data or Wiegand '1'
		26	Input from PIN - CardPresent
9	0V (for Keypad)	27	Input from PIN - TimeOut
10	Keypad column 0	28	Track 3 fingerprint template - Strobe
11	Keypad column 1	29	Track 3 fingerprint template - Data
12	Keypad column 2		
13	Keypad column 3	30	0V (for door controller)
14	Keypad row 0	31	Output to door controller - Strobe or Wiegand '0'
15	Keypad row 1	32	Output to door controller - Data or Wiegand '1'
16	Keypad row 2	33	Output to door controller - CardPresent
17	Keypad row 3	34	Output to door controller - TimeOut

Specifications

Case Details:

Height:	160mm
Width:	165mm
Depth:	65mm
Weight:	1 kg

Temperature

Operation	0°C to 40°C
Storage	-10°C to 50°C
Humidity range @ 40°C	10% to 80% (non-condensing)

Power Requirements:

10V to 14V
500mA max

In order to meet the requirements of EN60950 Verid should be powered from an SELV supply.

Verid is designed so as to comply with UL294. Verid complies with the following EMC requirements:

Europe

EN55022 Emissions (class A)
EN50082-1 Immunity (class A)

Warning: this is a "Class A" product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

North America

FCC rules CFR47 part 15 limit A

Verid has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is used in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Maintenance

Verid is essentially maintenance free but will benefit from periodic cleaning of the optics and housing. Clean the finger platen with a soft linen free cloth. The housing may be cleaned with a soft cloth and non-abrasive liquid detergent.

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