

SWEDGE User manual



www.stid-security.com



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Acknowledgment

Welcome in the world of the identification!

You have just purchased SWEDGE software.

We thank you for your trust and hope that this solution developed by STid will be to your entire satisfaction.

We remain at your disposal for any question.

Do not hesitate to contact us on our web site www.stid.com for more information.

The STid team



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1. Informations

Required computer configuration

- Computer with Windows 7, 8 or 10 operating system
- USB or RS232 port
- 50 Mo of free memory on hard disk

USB Key Content

- USB FTDI driver for Windows 7, 8 or 10.
- Swedge Version 1.4.x

Required hardware

- STid Desktop reader
 - ✓ USB
 - STR-R35-E/Ph5-5AB (13.56 MHz)
 - Or STR-R35-B/x03-5X (13.56 MHz)
 - Or ARC-R35-G/PH5-5AB (13.56 MHz)
 - Or ARCS-R35-G/PH5-5AB (13.56 MHz)
 - Or ARC-R35-L/Le2-5AB (13.56 MHz)
 - Or ARCS-R35-G/BTI-5AB (13.56 MHz & Bluetooth)

Or STR-W15-A/E01-5G (125 kHz)

- Or STR-W45-E/U04-5AA (UHF)(ETSI)
- Or STR-W55-E/U04-5AA (UHF)(FCC)
- ✓ RS232

STR-R32-E/Ph5-5AB (13.56 MHz)

- Or STR-R32-B/x03-5X (13.56 MHz)
- Or STR-W12-A/E01-5G (125 kHz)
- USB or RS232+ power supply
- SWEDGE software



86	33	8	80		2	19	15	25	18	18	9	21.3	•	•	2	1	11	20	23	8	81	1		1	8
55	83	2		2	5	11	11	25	65	35	2	81				53	12	52	23	83		22	2	3	3
Č.,	22	721				÷.	8	1	0	1	12	2	5		5	5	1	Ť.	1	2	8			2	1



Installation

Insert the SWEDGE USB Key on an USB port of your PC.

Wait for the automatic opening of the browser window.

Launch <u>SWedgeV14x_setup.exe</u> .

Follow the instructions on the screen.

Connect the reader:

- In case of STR-W1x-A/E01-5G: the green LED will be lighted at the moment of switching on.
- In case of STR-R3x-E/PH5-5AB: the orange LED will be lighted and the buzzer activated at the moment of switching on.
- In case of ARC-R35-G/PH5-5AB: the white LED will be lighted and the buzzer activated at the moment of switching on.
- In case of ARCS-R35-G/PH5-5AB: the white LED will be lighted and the buzzer activated at the moment of switching on.
- In case of ARCS-R35-G/BTI-5AB: the white LED will be lighted and the buzzer activated at the moment of switching on.
- In case of ARC-R35-L/Le2-5AB: the white LED will be lighted and the buzzer activated at the moment of switching on.
- In case of STR-W45-E/U04-5AA and STR-W55-E/U04-5AA: the orange LED will be lighted at the moment of switching on.
- In the case of the ARC-W55-G/U04-5AA, ARC-W45-G/U04-5AA enrollers/encoders: their white LED will light up and their buzzer will sound for 2 seconds as soon as they are switched on. <u>Make sure there are no tags nearby while connecting and setting up this reader.</u>



Starting software

Warning

If you do not have administrator rights, you <u>must</u> execute SWEDGE with "Run as administrator".

🕥 STid - SWed	lge RFID enroller v1.4.0.0		_ X
Reader type	9		Settings
Range A Range B,	ARC UHF E.G & L	* *	Start with system
Protocols	Custom		Auto run
			Hide when working
Data type	Truncate	Size (bits)	Beep after every read event
 Hex 	Before conversion	384 🌲	🗙 Caps Lock
Dec	After conversion		UserProfile
		Supplement by	
X CR/LF	Truncate MSB	Left Right	Chart
🗌 Anti Rep	0 🔷 (ms)		start 🔪 🌿

SWEDGE allows keyboard emulation when a tag is presented to the reader and a formatting of it according the parameters of the software.





2. Settings

Choice of the reader type

Reader type	
Range B,E,G & L	O ARC UHF
Range A	
- Hange H	

Gamme A	Gamme type B, E, G & L							
STR-W15-A/E01-5G	STR-R35-E/Ph5-5AB	ARC-R35-G/PH5-5AB						
STR-W12-A/E01-5G	STR-R35-B/x03-5X	ARC-R35-L/Le2-5AB						
	STR-W45-E/U04-5AA	ARCS-R35-G/PH5-5AB						
	STR-W55-E/U04-5AA	ARCS-R35-G/BT1-5AB						
	STR-R32-E/Ph5-5AB							
	STR-R32-B/x03-5X							
	ARC UHF							
	ARC-W55-G/U04-5AA							
	ARC-W45-G/U04-5AA							

Serial port setting

The communication between the software and the reader is done through a serial port (USB or

RS232). To do the configuration, please press this button «

Se	etup	×
	Settings	
	Port	
	Baud rate	38400
	Data bits	8
	Stop bits	1
	Parity	None
	Flow control	None
		OK Canad
		UK Lancel

Default baudrate for readers:									
9600 bauds	115 200 bauds								
STR-R35-E/Ph5-5AB	STR-W45-E/U04-5AA								
STR-R35-B/x03-5X	STR-W55-E/U04-5AA								
ARC-R35-G/PH5-5AB	ARC-W55-G/U04-5AA								
ARC-R35-L/Le2-5AB	ARC-W45-G/U04-5AA								
ARCS-R35-G/PH5-5AB									
ARCS-R35-G/BTI-5AB									
STR-W15-A/E01-5G									
STR-W12-A/E01-5G									
STR-R32-E/Ph5-5AB									
STR-R32-B/x03-5X									

».

Caution

It is important to install the USB driver provided with the software in the CD.

You can download new driver on http://www.ftdichip.com/Drivers/VCP.htm.



Settina	s parameters		



<u>Start with system</u> Activate the opening of the application at system startup.

<u>Auto run</u> Automatic execution of the application at opening the software with the parameters saved in the ini file.

<u>Hide when</u> working



By checking this box the application will be hidden in the taskbar.

- **Beep after every** Activate beep after each identifier reading. **read event**
- **Caps Lock** Activate caps locks.

UserProfile Unchecked box: The settings file Swedge.ini is saved in the directory containing the executable, by default: C:\Program Files (x86)\STid\SWedge v1.3.x.File content:

> [SWEDGE] UserProfile=0 ComPort=COM10 ComBaudrate=115200 ReaderType=0 HexDec=0 Truncate=0 Size=32 CRLF=0 MSB=0 AntiRep=0 AntiRepTimeout=0 AutoStart=0 AutoRun=0 HideWhenWorking=0 Beep=0 CapsLock=0 EditAddCharLeft=0 EditAddCharRight= Protocol=0



Checked box:

Warning: SWEDGE must be run in administrator mode to activate this option.

The settings file Swedge.ini is save in the user: C:\Users\username\STid\Swedge\Swedge.ini. File content: [SWEDGE] ComPort=COM10 ComBaudrate=115200 ReaderType=0

ReaderType=0 HexDec=0 Truncate=0 Size=32 CRLF=0 MSB=0 AntiRep=0 AntiRepTimeout=0 AutoStart=0 AutoStart=0 HideWhenWorking=0 Beep=0 CapsLock=0 EditAddCharLeft=0 EditAddCharRight= Protocol=0



3. Reader Configuration

If the reader was not purchased in a kit SWEDGE, it is necessary to configure it to work with the software.

STR-R35-B/x03-5X and STR-R32-B/x03-5X

These readers require no special configuration before use with SWEDGE. The reader reads the chip serial number in hexadecimal and sends it to SWEDGE on UID tag format.

STR-W15-A/E01-5G and STR-W12-A/E01-5G

The factory default parameters of these readers are read/write. To work with SWEDGE, they must be set to standalone. To do this, commands must be sent using a HyperTerminal.

Operating procedure:

- Open an Hyperterminal
- Connect the reader to configure
- Set the communication port:
 - Port COM number
 - o Baudrate 9600 bds
 - o Bits: 8
 - o Stop Bit 1
 - o Parity: none
- Send the three commands (hexadecimal value):
 - \02\20\04\00\00\24\03
 reader answer: \02\20\00\00\20\03
 - \02\2E\01\00\00\2F\03
 reader answer: \02\2E\00\00\2E\03
 - o \02\22\01\00\00\23\03 reader answer: none
- Checking: present a 125 KHz card on the reader, it must read continuously (beeps).

The reader reads the chip serial number (EM410x default chip) in hexadecimal and sends it to SWEDGE on a 40 bits frame (5 bytes).



STR-W45-E/U04-5AA and STR-W55-E/U04-5AA

The factory default parameters of these readers are read/write. To work with SWEDGE, they must be set to standalone.

We must send commands using an HyperTerminal or using the application SESpro.

Operating procedure to read EPC:

- Open an Hyperterminal
- Connect the reader to configure
- Set the communication port:
 - Port COM number
 - o Baudrate 115200 bds
 - o Bits:8
 - o Stop bit: 1
 - o Parity: none
- Send the commands below (hexadecimal value) :

Command 1

<02><00><09><00><00><00><00><00><05><AA><55><00><01><00><E5><55>

Answer 1

Command 2

Answer 2

<02><00><06><00><00><22><00><00><00><7><86>

Command 3

<02><00><09><00><00><00><00><25><AA><55><00><01><01><C0><7C>

Answer 3

<02><00><06><00><00><25><00><00><00><00><52>

Command 4

<02><00><0B><00><00><00><00><12><AA><55><00><03><62><01><0C><03><A7>
Answer 4
<02><00><06><00><00><12><00><00><00><FB><68>

Command 5

• Checking: present an EPCI GEN2 card on the reader, it must read continuously (beeps).

The reader reads the chip serial number in hexadecimal and sends it to SWEDGE on a 96 bits frame (12 bytes).



86	33	8	80		2	19	15	25	18	18	9	21.3	•	*	2	1	12	20	23	8	81	1		1	8
55	83	2		2	5	11	11	25	65	35	2	81				53	12	52	23	83		22	2	3	3
Č.,	22	721				÷.	8	1	÷.	1	12	2	5		5	5	1	Ť.	1	2	8			2	1



STR-R35-E/PH5-5AB, STR-R32-E/PH5-5AB, ARC-R35-G/PH5-5AB, ARCS-R35-G/PH5-5AB et ARCS-R35-G/BT1-5AB

These readers are configurable with configuration card create with SECard. Below are the parameters to select in SECard to configure the reader for operation with SWEDGE:

• Select the type of reader R32 or R35

Reader selection Communication interface	and reading modes	1)2)3)4)5)	<u>6</u>)
D only			
TL	Wie	egand or Clock&Data (R31/103)	0
rivate ID			
TTL	Wiegand or Clock&Data (R31) ⊚	Wiegand Enciphered (S31)	0
Serial	RS 232 (R32) O USB (R35	5)	0
Serial enciphered	RS 232 (S32) 💿 USB (S35	5) RS 485 (S33)	0
Serial with decoder	RS485 / Wiegand or Clock&Data (R3	3+INTR33E)	0
	RS485 / RS485 (S33+INTR33E 7AA/7	AB)	0
xternal functions activa	tion	Touchscreen configuratio	n
	4.5.1		

Serial settings

Autenticated encryption	Protocol options
- Serial communication parameters	Data size 7 🔮 byte(s)
Baudrate RS485 Address	Forced Site code on UID
Bidirectionnal mode	ISO14443-3B PUPI ✓ Enable ✓ MSB First
Security mode Plain -	Card ID range filter (LSB)
Data format	UID/ID 00000000 to 00000000
CR/LF	
ASCI STX+ETX No leading zeros	



• Configuring chip data to read: either UID in this case select for all chips UID and MSB First, either Private ID.



ARC-R35-L/Le2-5AB

These readers are configurable by serial link with SEGiC. Below are the parameters to select in SEGIC to configure the reader for operation with SWEDGE:

• Select the type of reader R35

and the second s			
Reader type -			
TTL		Wiegand	or Clock&Data (R31) 🔿
Serial	RS 232 (R32) 🔘	USB (R35) 💿	RS 485 (R33) 💿
External func	tions activation	□ Tamper swite ☑ Erase stamp	ch signal o on tamper switch activation
External func	tions activation	☐ Tamper switc ☑ Erase stamp ☑ Life signal ☐ On tamper a	ch signal o on tamper switch activation ctivation keeps LED red as defa

• Reader communication protocol

ters. LED and Buzzer	
default state Mode Co Off Fixed Blinking Pulse Rainbow	blor I
link duration Pulse	speed
detection action	blor - I
uzzer duration	
	uzzer duration x100ms Back



ARC-W55-G/U04-5AA et ARC-W45-G/U04-5AA

These readers are configurable in SWEDGE by selecting the Reader Type: ARC UHF then clicking on the ARC UHF Parameters button.

Reader type		
Range A	ARC UHF	8 ⁰ 🔶
Range B,E,G & L		T

Make sure there are no tags near the reader during the setup phase.

AF	RC UHF parameters	х	
	Reader mode SWEDGE Enroller		
	Encoder		
	User ID Security (EPC)		
	Plain		
	Enciphered		
	Private key définition (16 bytes)		
	000000000000000000000000000000000000000	000	
	Apply		

SWEDGE Enroller mode is the main mode of use with SWEDGE software.

The "Encoder "mode allows to switch the reader to write mode for use with STid's SESPRO and ULTRYS v2 softwares.

SWEDGE offers the ability to upload secure tag IDs (EPCs), which have been encoded with ULTRYS v2 and encrypted with a 16-byte private key.

To enable SWEDGE to read and display these encrypted tags, simply select the "Enciphered" option, and fill in the 16-byte private key.

The "Apply" button allows to apply the defined parameters to the reader (choice of "SWEDGE enroller" or encoder mode and choice of EPC the secure mode).



4. Format settings

Custom	-
Wiegand 26 bits - 3i	4
Clock&Data 32 bits - 2H	
Clock&Data 40 bits - Iso 2B	
Wiegand 36 bits (32+4 LRC) - 3Ca	
Wiegand 44 bits (40+4 LRC) - 3Cb	н
Wiegand 32 bits - 3La	
Wiegand 40 bits - 3Lb	
Wiegand 64 bits - 3T	Y

Protocol Custom

All parameters are to be set.

Protocols	Custom	
Data type • Hex	Truncate • Before conversion	Size (bits) 32
Dec	After conversion	
× CR/LF	Truncate MSB	Supplement by Left Right
🖉 Anti Rep	0 (ms)	

Data typeHexDec	Choose the data type decimal or hexadecimal.
CR/LF	If activated, SWEDGE will do a return after each reading.
🗙 Anti Rep 0 🔶 (ms)	If activated, SWEDGE not return the read code as it will be identical to the preceding and during the timing sets.
TruncateBefore conversionAfter conversion	Selects if the SWEDGE truncates the data before decimal conversion or after (only available if the data type selected is DEC).
Truncate MSB	If activated, SWEDGE truncates MSB first instead LSB.
Size (bits) 32	Size of the ID. In bits or in digits according the configuration.



Predefined Protocol

The setting for the most common protocols has been predefined.

<u>26-bits Wiegand – 3i</u>: Site code and card code are displayed in decimal and concatenated into the text field.

Example: Card encoded with site code 001 et card code 255



For Wiegand 3i, Clock&Data 2H and 2B, the field Truncate is configurable to the needs.

Supplement by Left or Right

Used to force character(s) before or after the data to read. Previous example with forced AA before:

🔘 STid - SWedge RFID	enroller v1.3.2.7				_ ×
Reader type	A ARCHUE			Setti	ngs
Range B,E,G & L	• AKC OHP		¢°	Start with s	system
Protocols Wiegan	d 26 bits - 3i		F	Auto run Hide when	working
Data type Trun	cate	Size	(bits)	🔲 Beep after	every read event
• Hex • Be	fore conversion	24	÷	X Caps Lock	
• Dec • Af	er conversion			UserProfile	
		Supplem	ient by		
X CR/LF 📃 Tru	ncate MSB	Left	Right	Ston	A
Anti Rep 0	\$ (ms)	AA		otop	
Received:00000000000000 Formated:AA00100255 Sent to foreground window	000000000 100 FF				



APPENDIX: Communication protocol

ISO2 Clock&Data protocols

ISO 2B

Variant	Format	Frame on 112 bits	Values		
2B	Decimal (BCD)	13 characters	0 - 9		

Reading tag on 5 bytes (40 bits) and decimal conversion.

<u>Example:</u>

For a hexadecimal ID "0x187E775A7F", number will be "0105200966271". The frame sent by the reader will be:

C	000	1101 0	00001	1000 0	00001	1010 1				0110 1	0100 0	1110 0	1000 0	1111 1	1111 1	000
		В	0	1	0	5	2	0 09	6	6	2	7	7	F	F	
	Zeros	S.S	Car.1	Car.2	Car.3	Car.4		Car		Car.10	Car.11	Car.12	Car.13	E.S	LRC	Zeros

ISO 2H

Variant	Format	Frame on 97 bits	Values		
2H	Decimal (BCD)	10 characters	0 - 9		

Reading tag on 4 bytes (32 bits) and decimal conversion.

Example:

For a hexadecimal ID "0x06432F1F", number will be: "0105066271". The frame sent by the reader will be:

000	1101 0	00001	1000 0	00001	1010 1			0110 1	0100 0	1110 0	1000 0	1111 1	0010 1	000
	В	0	1	0	5	0	6	6	2	7	1	F	4	
Zeros	S.S	Car.1	Car.2	Car.3	Car.4	Car		Car.7	Car.8	Car.9	Car.10	E.S	LRC	Zeros



36	(\mathbf{x})	\mathbb{R}^{2}	(0)	(\mathbf{r})	(\mathbf{z})	(0)	(θ)	18	28	18	\mathbb{R}	22	28	(\mathbf{r})	0.00		${\mathbb P}_{i}^{(n)}$	(\cdot)	(0)	(\mathbf{x})	\mathbb{R}^{2}	[0]	$\langle t \rangle$	(\mathbf{r})		10	18
15	83	\mathbb{R}^{2}	$\langle t \rangle$		\sim	\mathbb{S}^{2}	(2)	(π)	35	65	25	~ 2	22				23	13	20	33	83	(2)	32	(\mathbf{z})		35	$\left(\gamma \right)$
55	22	13					22	88	25	15	12	12	2	1	120		53		51	50	5	33		1		22	15
10	27	-	2	۳.	-		3	۰.	1	1	17	2				*	•		72	-	-		5		-		3

Wiegand protocols

Wiegand 3CA

Bit 1 Bit 32	Bit 33 Bit 36
Data "MSB first"	LRC

- > Data: 8 hexadecimal characters "MSByte first" (32 bits)
- > LRC: 1 control character (XOR of all digits)

For a hexadecimal ID "0x001950C3", the frame sent by the reader will be:

0000	0000	0001	1001	0101	0000	1100	0011	0010
0	0	1	9	5	0	С	3	2
Car.1	Car.2	Car.3	Car.4	Car.5	Car.6	Car.7	Car.8	LRC

Wiegand 3CB

Bit 1 Bit 40	Bit 41 Bit 44
Data "MSB first"	LRC

- > Data: 10 hexadecimal characters "MSByte first" (40 bits)
- LRC: 1 control character (XOR of all digits)

For a hexadecimal ID"0x01001950C3", the frame sent by the reader will be:

0000	0001	0000	0000	0001	1001	0101	0000	1100	0011	0011
0	1	0	0	1	9	5	0	С	3	3
Car.1	Car.2	Car.3	Car.4	Car.5	Car.6	Car.7	Car.8	Car.9	Car.10	LRC



26	\mathcal{H}	\mathbb{R}^{2}	(0)	(\mathbf{r})	(\mathbf{s})	(0)	(0)	(2)	25	18	$\odot t$	\mathbb{C}^{n}	21	$\sim 10^{-10}$	010		${\mathbb S}^{\times}_{2}$	(\cdot)	(0)	(2)	\mathbb{R}^{2}	$\left \theta \right i$	(0)	(\mathbf{r})		(0)	18
55	\mathbb{R}^{2}	\mathcal{A}	(2)			35	(2)	(2)	85	65	$\mathbb{R}^{n}_{\mathcal{O}}$	\mathbb{S}^{n}	32		. • .		\mathbb{S}^{2}	\mathbb{S}^{2}	20	33	83	(2)	25	(\mathbf{z})	\sim	55	15
53	22	12						88	25	15	12	32	2	3	120	1	53		<u>*</u> 1	50	22	23				22	15
	27	-		Ψ.	-	-	$\langle T \rangle$	Ψ.	15		17	2				*	۰.			-	-	1	τ.	Ξ.	-		ġ.

Wiegand 3LA

As "Wiegand 3CA" without LRC.

Wiegand 3LB

As "Wiegand 3CA" without LRC.

Wiegand 3i

Variant	Format	Data 24 bits	Values
3i	Hexadecimal	6 characters	0 - F

Bit 1	Bit 2 Bit 25	Bit 26
Even parity bit 2 bit 13	Data (24 bits)	Odd parity bit 14 bit 25

- > Even parity: 1 bit of even parity on the 12 following bits
- > Data: 6 hexadecimal characters "MSByte first"
- > Odd parity: 1 bit of odd parity on the 12 previous bits

For a hexadecimal ID"0x0FC350":

The frame sent by the reader will be:

0	0000	1111	1100	0011	0101	0000	1
	0	F	С	3	5	0	
Parity	Car.1	Car.2	Car.3	Car.4	Car.5	Car.6	Parity

The data formatted is: 01550000.



85	33	\mathbb{R}^{2}	$\langle t \rangle$	(\mathbf{r})	(\mathbf{z})	3	(\mathbf{r})	18	25	18	\mathbb{R}	22	28	10	0.10		52	$\{\cdot\}$	(0)	(0,0)	\mathbb{R}^{2}	[0]($\langle \hat{v} \rangle$	(\mathbf{f})		10	18
55	83	\mathbb{R}^{2}	(2)	22		15	15	(2)	35	65	$\mathbb{R}^{n}_{\mathcal{O}}$	\mathbb{C}^{n}	32				53	53	55	35	83	(2)	32			55	15
55	22	13						88	25	10	12	12	2	3	120	2	53	13	51	50	5	83				22	
κ.	10	-			-	Ξ.			1.0		1.4	1.0	1.1				1.1		*	-	-	11			-		(\mathbf{x})

History revisions

Date	Version	Description
09/08/2010	1.0	Initial version of the document
07/09/2010	7.7	Modification of the first page.
11/10/2010	1.2	Modification of the first page.
17/10/2011	1.3	STR-W45-E-U04-5AA reader added.
03/04/2102	1.4	Service mode added
03/09/2012	1.5	Addition of setings (Start with system, Auto run, Hide when working, Beep after every read event) Addition of reader references STR-R3x-B/x03-5X and STR-W55-E/U04-5AA
24/01/2013	1.6	Modification of the index of the executable 1.2.0 to 1.2.x
04/07/2013	1.7	Addition of "Truncate MSB"
22/12/2014	1.8	ARC-R35G/PH5-5AB added, Caps Lock in Settings added, Timing on antirepresentation Defaut Configuration changed 7bytes instead 5 bytes for STR R35 E & ARC R35 G.
24/04/2015	1.9	ARC-R35L/Le2-5AB added, In Settings User Profile added, Predefined protocols added, Supplement by added.
15/10/2018	1.10	ARCS-R35G/PH5-5AB & ARCS-R35G/BTI-5AB added, USB key instead of CD ROM
26/102020	7.77	ARC-W55-G/U04-5AA, ARC-W45-G/U04-5AA added