ADK-8582 Evaluation Board

HI-8582/8583
Evaluation Kit Users Guide

June 2017

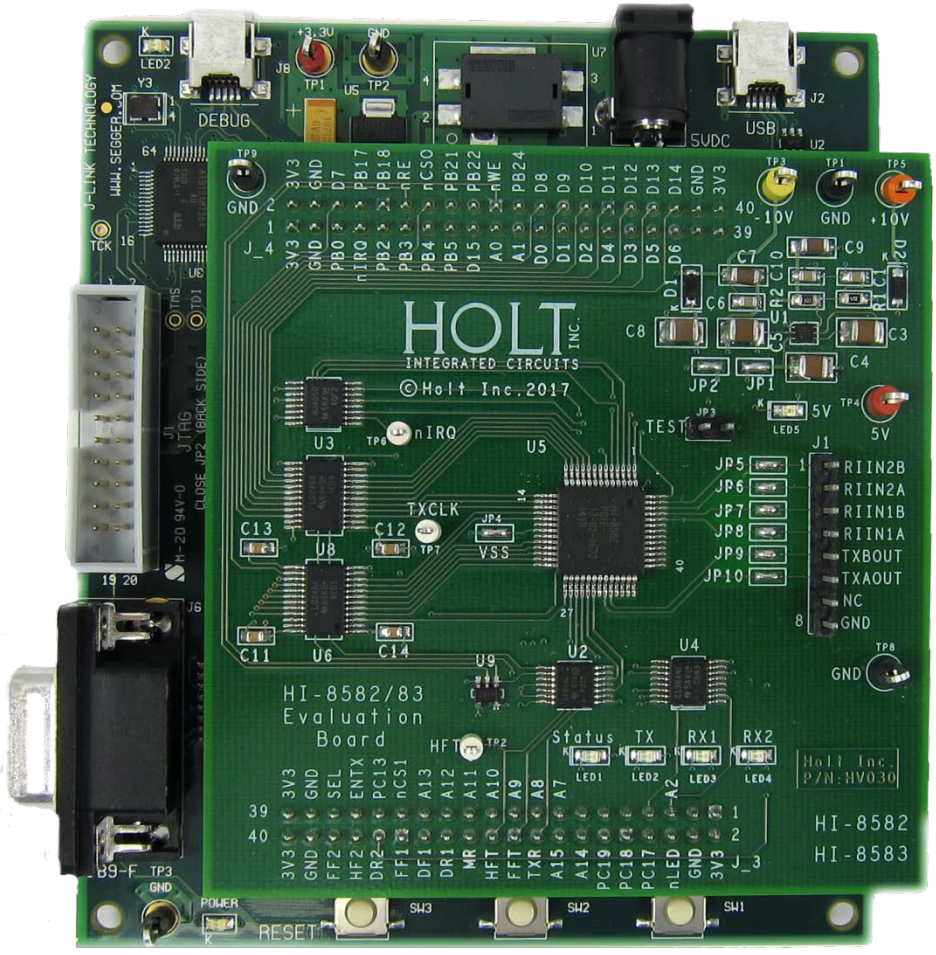
REVISION HISTORY

Revision	Date	Description of Change
AN-8582, Rev. New	06/07/17	Initial Release

Introduction:

The Holt HI-8582/8583 ARINC 429 Evaluation Board demonstrates most features of the HI-8582/8583 5V Terminal IC. The HI-8582/8583 Terminal IC features a single transmitter with integrated line driver and two receivers. The transmitter and both receivers feature 32 x 32 FIFOs. The device (HI-8582/3583) uses a 16-bit parallel data bus for interfacing to a microcontroller or FPGA. For 3.3V applications the HI-3582A/3583A version of this part is available.

The 2-board Holt evaluation kit uses an Atmel Cortex M3 32-bit microcontroller (MCU) to demonstrate the features of the device. The MCU is located on the lower board and a separate HI-8582/8583 daughter card plugs on top of the MCU board. The daughter card can be removed from the lower board and used separately with another host FPGA /MCU interface. A serial port in the MCU displays ARINC 429 transmits and receives words on the console when the computer runs a terminal emulation program like HyperTerminal or TeraTerm. The demo program includes a menu of commands entered from the console to alter the configuration of the HI-8582 (either HI-8582/8583) by modifying the Control Word register bits on-the-fly. Using the console commands provide a convenient way to learn the HI-8582 by making changes and seeing the effect on ARINC 429 words displayed on the console or by viewing the transmissions on an oscilloscope.



This guide explains how to quickly get set up and running. Additional support material and the full software project are provided in the included CD-ROM. Since the demo code is pre-programmed in the microcontroller flash, the demo is operational right out of the box. No software development tools are needed to run the demo. The IDE toolset used to compile and debug this demo software project is IAR Systems Embedded Workbench® for ARM (32K KickStart Edition). More information is provided on the IAR toolset and software later in this document.

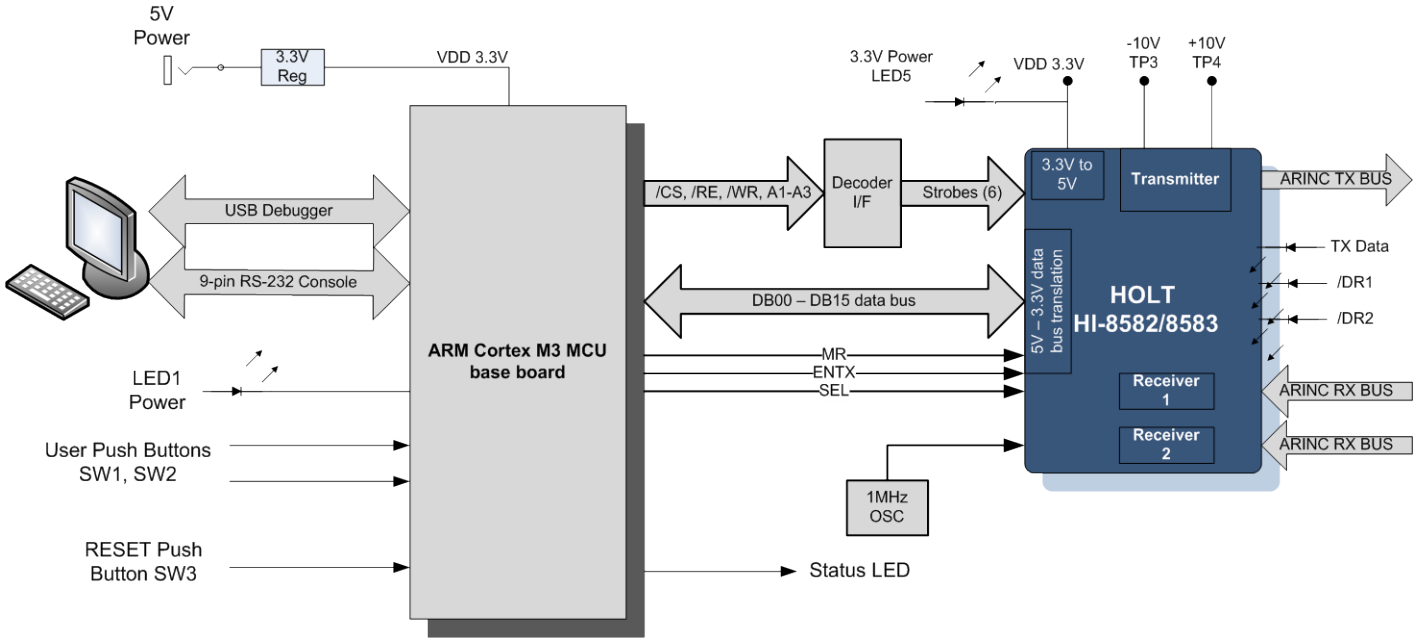
Evaluation Kit Contents

- This Application Note AN-8582 User's Guide.
- ARM Cortex M3 lower board and schematic.
- HI-8582/8583 plug-in daughter card and schematic.
- +5V power adapter for the ARM Cortex M3 base board. A +/- 10 power supply is not provided.
- 8-pin jumper strip for RX/TX external loopback.
- HI-8582/8583 Data Sheet.
- RS-232 9 Pin Serial Cable.
- Demo Project compatible with IAR Embedded WorkBench® for ARM
- Low-Level C drivers (module included in the project).
- CD-ROM containing all the documents and software.

Topics:

- Evaluation Board Block Diagram
- Evaluation Board set up
- Quick Start Guide
- Program Overview
- Flow charts
- IAR Embedded Workbench® for ARM software toolset
- Schematics diagrams and bill of materials
- Summary

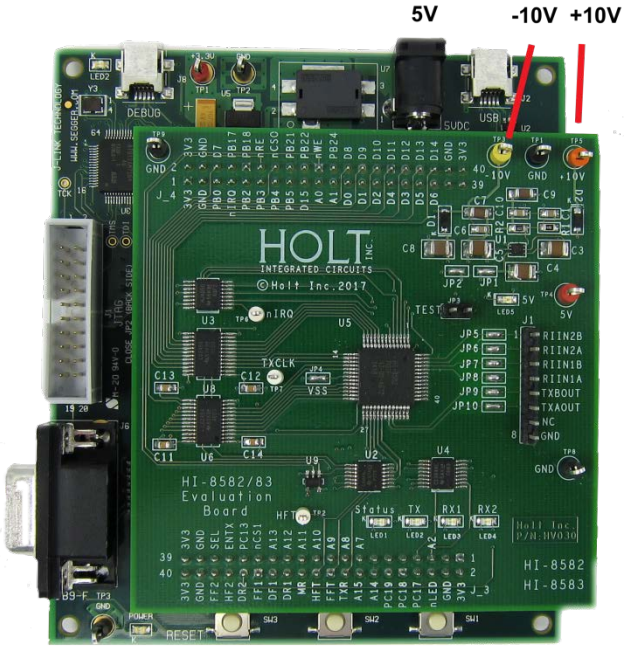
Evaluation Board Block Diagram (two-board set)



Demonstration Board Set Up

1. Connect the included 5V power adapter to the 5VDC IN jack.

2. Connect a bench dual power supply (not provided) with -10 volt, +10 volt and ground to the daughter card test points. When +10V is applied the 5V DC-DC voltage regulator is enabled and the red 5V LED will light. A dual +/- 10V power supply is required for the IC and demo to work properly.



3. Connect the included RS-232 cable between the board and the PC Serial (COM) port. Configure the serial communication on the PC for 115200 Baud, 8 bits, No Parity, No handshaking. If a PC Serial port is not available, an USB to Serial adapter may be needed (not provided). Four seconds after power up, the demo program starts loading the HI-8582 FIFO transmit register with ARINC 429 words and starts to transmit incrementing data words. ARINC 429 data words are viewable with an oscilloscope on J1 pins 5 and 6.

4. The daughter card should have an 8-pin jumper-plug inserted into J1 header. This connects the transmitter outputs to both receiver inputs. This jumper-plug is shown below and used in the demonstrations.

Quick Start Guide

1. After the demo board has been powered up, the MCU displays information on the console, starting with the name and revision of the program. The demo program then issues a master reset pulse to the HI-8582 and reads back the contents of the Status Register. If the value read is 0x0040, program execution continues. If any other value is read, the program displays “Part Not Detected“and the value from the Status register, then enters a perpetual loop.

   A +10V supply must be connected to TP5 or the message “Part Not Detected” will result.

```
*** Part Not Detected, Status Reg Invalid =0xXXXX
   Check for +10V and -10V connected on the board.
   +10V enables the 5V power supply for the 8582.
   Should be 0x0040. Try again and press Reset
```

   The demo program displays a menu of available commands and pauses for 4 seconds, and then automatically begins transmitting ARINC data words. To view this menu for a longer time, press the space bar on the PC keyboard. Anytime during transmission, pressing the space bar will pause the program, or press the H (or h) key to display the menu again.

```
Holt Integrated Circuits HI-8582/8583 Demo Board Ver: 1.0
 Compiled: May 1 2017 14:43:55

*** Part Detected ***
Status Reg Valid =0x0040
Control Word = 0x8030

***********************************************
   Holt Integrated Circuits HI-8582/8583
        Compiled: May 1 2017 15:53:46
***********************************************

Press-0 to Enter Hardware Test mode, Pulse 74LVC138 decoder outputs
```

```
Press-1 to Toggle Enable/Disable Receiver-1 label recognition
Press-2 to Toggle Enable/Disable Receiver-2 label recognition
Press-5 to Enable Receiver-1 Encoder data9=0 and data10=0 bits
Press-6 to Disable Receiver-1 Encoder data9=0 and data10=0 bits
Press-7 to Enable Receiver-2 Encoder data9=0 and data10=0 bits
Press-8 to Disable Receiver-2 Encoder data9=0 and data10=0 bits
Press f or F to Toggle between FIFO Empty and FIFO Full demonstration
Press l or L to load and read back 16 labels on Rec-1 and Rec-2
Press h or H to Display this Menu
Press m or M to apply a MR pulse to the HI-8582/83
Press p or P to Toggle Transmitter ARINC bit32 between data or Parity
Press s or S to Toggle the HI-8582/83 between Scramble and Un-scramble mode
Press r or R to Toggle between HIGH SPEED and LOW SPEED
Press t or T to Toggle between Self-Test Mode and Normal Operation
Press SPACE BAR to Pause

Program will begin in 4 seconds, Press H to see this menu again.
```

2. With the jumper-plug inserted into J1, the console outputs the Status register and Control Word values, followed by a second line showing the transmitted 32-bit ARINC 429 word and 8-bit Label value. The program increments the upper 16 bits after each transmission of the ARINC 429 word, leaving the lower 16 bits of the words as 0x43LL, where LL represents the Label value. The default Label value is 0x01 and is displayed again for easy identification. Both receivers should display the same values as the preceding transmitter word and each transmission is separated by approximately a 320ms delay.

```
Status Reg =  0x0040    Control Word = 0x8030
Transmitter:  0x00004301  Label: 0x01
Receiver-1 :  0x00004301  Label: 0x01
Receiver-2 :  0x00004301  Label: 0x01

Status Reg =  0x0040    Control Word = 0x8030
Transmitter:  0x00014301  Label: 0x01
Receiver-1 :  0x00014301  Label: 0x01
Receiver-2 :  0x00014301  Label: 0x01

Status Reg =  0x0040    Control Word = 0x8030
Transmitter:  0x00024301  Label: 0x01
Receiver-1 :  0x00024301  Label: 0x01
Receiver-2 :  0x00024301  Label: 0x01
```

3. Press SW1 push button increments the Label value.

```
Status Reg =  0x0040    Control Word = 0x8030
Transmitter:  0x00024302  Label: 0x02
Receiver-1 :  0x00024302  Label: 0x02
Receiver-2 :  0x00024302  Label: 0x02
```

4. Press SW2 push button decrements the Label value.

```
Status Reg =  0x0040    Control Word = 0x8030
Transmitter:  0x00024301  Label: 0x01
Receiver-1 :  0x00024301  Label: 0x01
Receiver-2 :  0x00024301  Label: 0x01
```

5. Remove the J1 jumper-plug. The display shows only the transmitter data.

```
Status Reg =  0x0040    Control Word = 0x8030
Transmitter:  0x00004301  Label: 0x01

Status Reg =  0x0040    Control Word = 0x8030
Transmitter:  0x00014301  Label: 0x01

Status Reg =  0x0040    Control Word = 0x8030
Transmitter:  0x00024301  Label: 0x01
```

6. While the program is transmitting ARINC 429 words, bus signals can be viewed with an oscilloscope on J1 pins 1-6. See schematic for the actual pin-out. If the jumper-plug is installed, connect the oscilloscope to the two connections on the top of the jumper.

7. To apply an external ARINC 429 transmitter source to either Receiver-1 or Receiver-2, first remove the jumper-plug on J1 and connect the RIINXA and RIINXB pins to the external transmitter. The demo program defaults to High Speed (100kbps) with no label recognition so any valid ARINC 429 word should be displayed by the demo board. If the external ARINC 429 transmitter is set to Low Speed, Press the 'R' key on the console to change the demo board to Low Speed.

8. Daughter card LEDs

LED	NAME	FUNCTION
LED1	Status	Flashes to show loop activity
LED2	TX Data	Turns on when TX FIFO loaded
LED3	RX-1 (Receiver-1)	Turns on when data is received
LED4	RX-2(Receiver-2)	Turns on when data is received
LED5	Power on (red)	On to indicate 5V power

9. To learn more about the demo program, features and capabilities of the HI-8582/8583 Terminal IC and IAR Embedded Workbench ®IDE software development tool, read the following sections.

Demo Program Overview

After the program completes the initialization and displays the header menu, the program executes a repeating main loop that transmits an incrementing data pattern, flashes LED1 on and off, checks for a button press on either SW1 or SW2 and polls each receiver for data reception. When receiver reception is detected, the program reads out the FIFO data and displays the data on the console. The serial port is checked at the end of the loop for possible console commands entered by key press. Console commands direct the MCU to modify the Control Register (CR) bits on-the-fly while the program transmits and receives ARINC 429 messages, so that the effects are immediately visible on the console or oscilloscope. A complete list of Console Commands is shown below and a full description of the sixteen Control Word (CR) bit fields is described on page 3 of the HI-8582/8583 data sheet.

Console commands execute when the corresponding single letter or digit is pressed on the console PC keyboard. Letters can be entered in lower or upper case. Most commands pauses the program and display the updated command status for one second, then automatically resume transmission. For example, pressing the 'R' key executes the HIGH SPEED/LOW SPEED toggle command. Since the program defaults to High Speed after power up, the program will respond by displaying LOW SPEED (showing the new state) for one second, then begins Low Speed transmission.

LOW SPEED (new speed is Low Speed)

Console Command List:

Press-0 : Execute a hardware test sequence. The program sequentially reads each address which produces a negative pulse on the 74LVC138 decoder in an endless loop. Press the reset button to exit this test.

Press-1: Toggles (CR1) enabling/disabling Label recognition for Receiver-1.

Press-2: Toggles (CR3) enabling/disabling Label recognition for Receiver-2.

Press-5: Enables Receiver-1 decoder (CR6) to only pass messages with bit9 and bit10 matches to CR7 and CR8 respectively.

Press-6: Disables Receiver-1 decoder (CR6) (from command-5).

Press-7: Enables Receiver-2 decoder (CR9) to only pass messages with bit9 and bit10 matches to CR10 and CR11 respectively.

Press-8: Disables Receiver-2 decoder (CR9) (from command-7).

Press-Space Bar: Pauses the program and stops transmitter and receiver reception until any key is pressed.

Press-F: FIFO Empty/Full demonstration.
The demo program default after a power up, checks the transmit FIFO (SR7) not full and receiver FIFO contains valid data flags (SR0 and SR3) in the Status register before writing or reading the FIFO. This transmits and receives one message after the other one at a time. When command F is entered the program uses the transmit Full and the receiver empty flags. The program fills the transmit FIFO with 32. After the FIFO is full the program polls the receivers and reads all the FIFO data until the FIFO flags indicate empty.

Press-L Loads all 16 labels from a "C" array to Receiver-1 and Receiver-2 label memories. Receiver-1 will have odd values and Receiver-2 will have even values. This command only loads the label memory. Command 1 or command 2 must be used to enable the label recognition to take effect.

```
Receiver-1 Labels Loaded:
0x01 0x03 0x05 0x07 0x09 0x11 0x13 0x15 0x17 0x19 0x21 0x23 0x25 0x27 0x29 0x31
Receiver-1 Labels Read:
0x01 0x03 0x05 0x07 0x09 0x11 0x13 0x15 0x17 0x19 0x21 0x23 0x25 0x27 0x29 0x31

Receiver-2 Labels Loaded:
0x00 0x02 0x04 0x06 0x08 0x10 0x12 0x14 0x16 0x18 0x20 0x22 0x24 0x26 0x28 0x30
Receiver-2 Labels Read:
0x00 0x02 0x04 0x06 0x08 0x10 0x12 0x14 0x16 0x18 0x20 0x22 0x24 0x26 0x28 0x30
```

Press-H Displays the Console command menu.

Press-M Issues a Master Reset pulse to the HI-8582 and writes the default Control Word value 0x8030 to Control Word register.

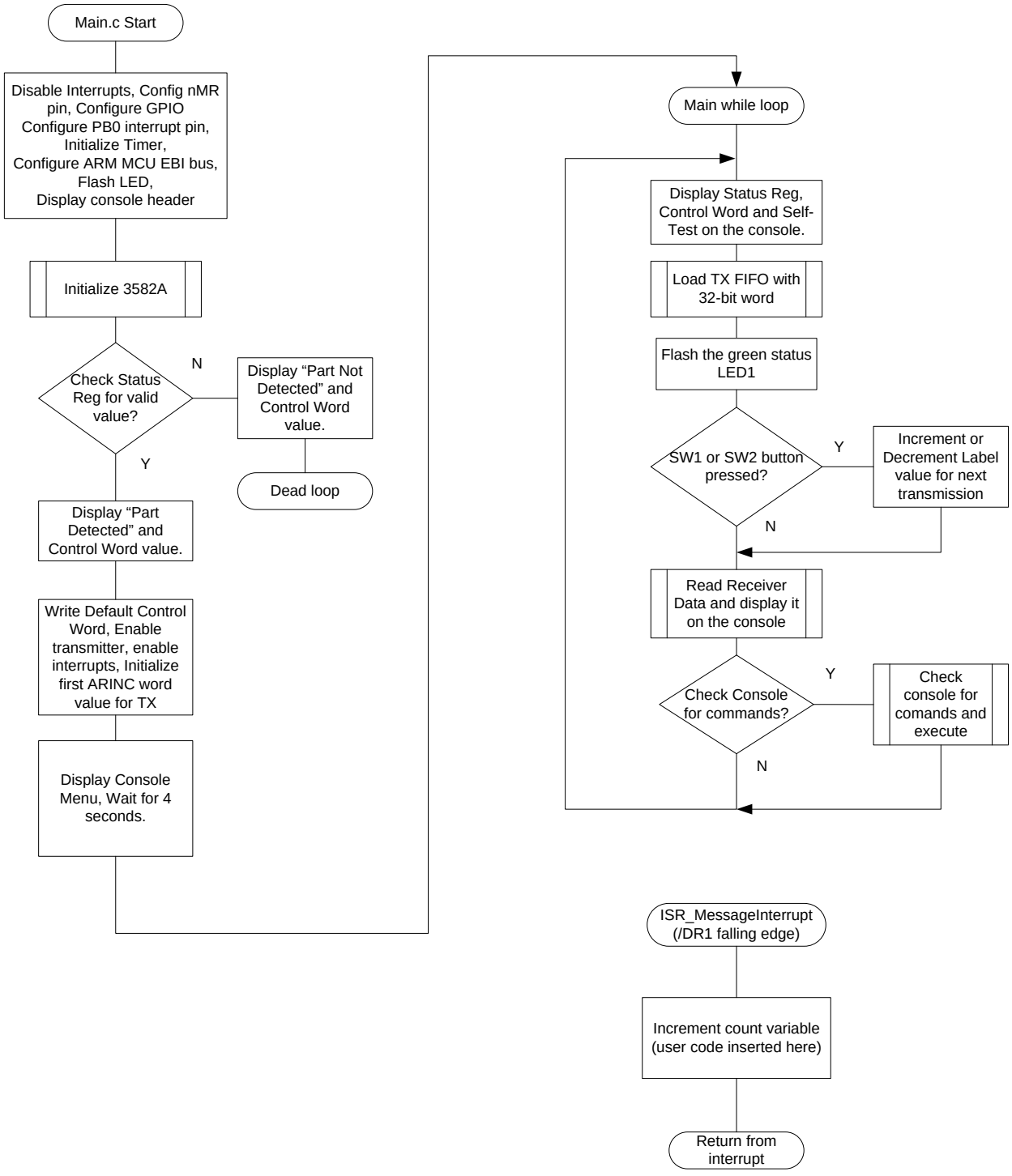
Press-P Toggles CR4 in the Control Register to alter the transmitter 32nd bit between data or parity.

Press-S Toggles CR15 in the Control Register to switch between Scrambled and Unscrambled data mode. See page 4 of the data sheet for a table showing the data mapping.

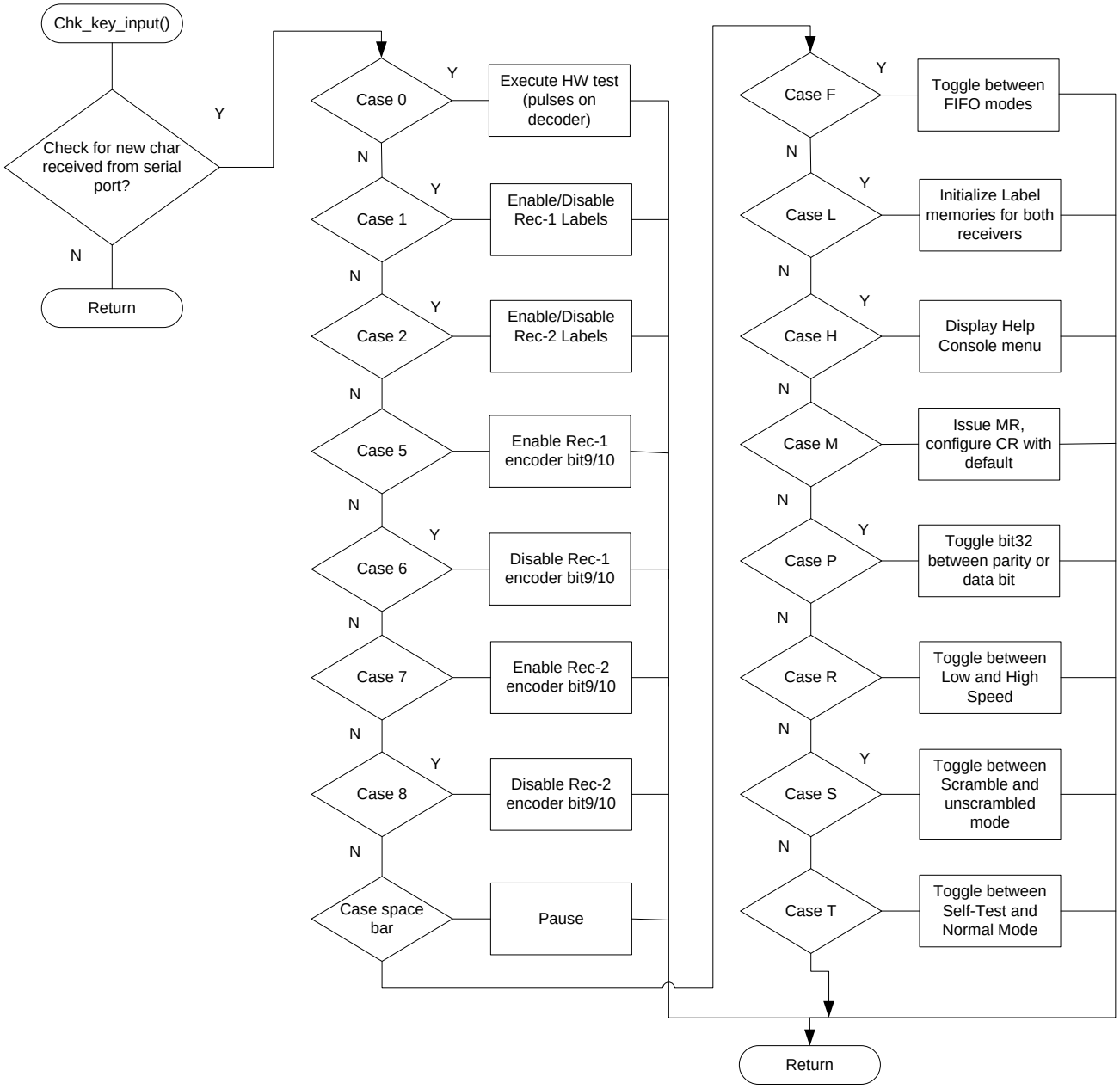
Press-R Toggles CR0, CR13 and CR14 to reconfigure the transmitter and both receivers between low speed and high speed.

Press-T Toggles CR5 to switch between Self-Test and Normal modes.

Software Program Flow-chart (main.c)



Software Program Flow-chart, console commands



5V power supply to HI-8582

Ideally the HI-8582 is powered in a 5V system. In this reference design the HI-8582 daughter card is fitted on top of a 3.3V MCU main board. Voltage translation IC's are used to translate 5V outputs of the HI-8582 to the MCU. MCU (ARM CM3) 3.3V address, data and control strobes are translated to 5V. In a 5V only design voltage translation is not needed so the design is much simpler. For new 3.3V designs the HI-3582A,3583A 3.3V part is recommended.

The bottom main board only provides 3.3V on the connector headers so a DC-DC converter is used to boost up the 3.3V to 5V required by the HI-8582. The 5V converter is turned on only when +10 volts is applied to the +10V test point. The 5V is delayed from when +10V is applied and is controlled by a small delay network connected to the enable pin of the TPS60150 5V converter IC. The HI-8582 5V supply should be powered after +10V is applied which meets the requirement in the Power Supply Sequencing section of the data sheet. When interfacing a 5V part (8582) to a 3.3V microcontroller or FPGA host, voltage translation is required. Two IC's 74LVCC4245A U6 and U8 perform this function. The HI-8582 has 3.3V compatible inputs so translation from 3.3V to 5V is not necessary.

For a 5V only design the IC's U1, U2, U3, U6 and U8 are not needed.

Using the HI-8582/8583 Daughter card with an external MCU or FPGA

To use the daughter card with a user host for prototyping, unplug the daughter card and make the necessary connections to the 16-bit bus signals, A1-A3 address lines, nWR , nRD and nCS. All these signals are available on the J3 and J4 header pins. Apply a 3.3 volt supply to one of the J3 or J4 pins (pin 39 or pin 40). Connect a +10 volt supply to TP5 and -10 volt supply to TP3. The timing requirements for the 16-bit data bus and control signals are found in the product data sheet. For a 5V only system the daughter card can be used with the translations IC's in place. In the final design they should be removed since they are not needed in a 5V only system. For the same reasons the translation IC's U3 and U2 are also not needed. To use an external 5V supply instead of the 3.3V boost converter remove J1 and connect an external 5V supply to TP4, this will supply 5V to OSC1, U5, U6 and U8.

Daughter card Jumpers

TEST INPUT (Transmitter Disable) JP3. This jumper is normally open. When it is closed, a high is asserted on the TEST input pin which disables the transmitter.

IC current measurement solder links JP4 and JP2 are provided to allow current measurements.

Line Driver resistor jumpers:

The HI-8582 includes two 37.5 ohm series resistors integrated into the transmitter outputs capable of driving the ARINC 429 bus directly so jumpers JP9 and JP10 should be shorted. These jumpers should be

open if the HI-8583 is used. When a HI-8583 is used, the internal 10 ohm resistors in series with the external 27.4 ohm resistors will provide the needed 37.5 ohm output resistance.

Receiver input resistors:

Each receiver input line on the PCB has a jumper which bypasses a series 10K ohm resistor. Non-dashed numbered parts have internal 35K ohm input resistors. On -10 parts, the two internal resistors are 25K. These parts require external 10K ohm series resistors. Notes on the schematic show the proper jumper settings for using the -10 version of the part. When using the -10 part in a design place the 10K resistor nears the part for optimum performance.

External resistors are used in lightning protection schemes implemented with external components. For information on lightning protection see AN-300 and AN-301 application notes.

IAR IDE Embedded Workbench® and ARM Cortex M3 Demo Project

The following steps install and configure the C compiler and describe how to load and modify the demonstration project using the HI-8582/8583 Application Development Kit.

1. Installed IAR Systems *Embedded Workbench for ARM* (*EWARM* 7.1 or greater) is required BEFORE adding the Holt demo project, so all Atmel board library files and the demo project folder are created in the proper locations. Follow *the "Holt HI-8582 Demo Project Installation Guide"* found in the Project folder on the Holt CD-ROM. Before proceeding to the next steps IAR must be installed and the Holt project folder must be in the proper folder location, according to that guide. **Instructions beyond this point assume you have completed the above installation tasks.**

2. Launch IAR *Embedded Workbench* from the Windows Start menu. A blank screen should appear. Open the Holt HI-8582 Demo Project from the IAR File pull-down menu, click on File/Open/Workspace and navigate to the project folder location and select "HI-8582_83 Demo.eww" and click the Open button.

3. Debug requires an interface between the computer running IAR Embedded Workbench® and the HI-8582 Application Development Kit. Connect the small end of the provided USB cable to the evaluation board USB connector marked DEBUG. Connect the other end of the USB cable to a free computer USB port. The IAR C-SPY Debugger for ARM includes drivers for numerous target system interfaces, including built in "J-link On Board".

   The first time the evaluation board USB cable is connected to the computer, the Windows "Found New Hardware" message should appear for the J-Link device. After several seconds, Windows should load the appropriate driver and advise, "Your hardware is ready for use". If Windows fails to find the J-Link driver, direct it to look in the Drivers directory the IAR Embedded Workbench® installation CD.

   If difficulties arise when initiating a debug session at step 5, click **Project** then **Options**. In the window that opens, under **Category** = **Debugger** highlight **J-Link/J-Trace**. Click the tab labeled **Connection**, then verify Communications = USB and Interface = SWD.

3. Open IAR Embedded Workbench®. Click **File**, then **Open Workspace**, then navigate to the project subdirectory created in step 4. Select the project file with .eww extension, then click **Open**. (The next time Embedded Workbench® opens, this project will appear in the Recent Workspaces list when **File** is clicked.)

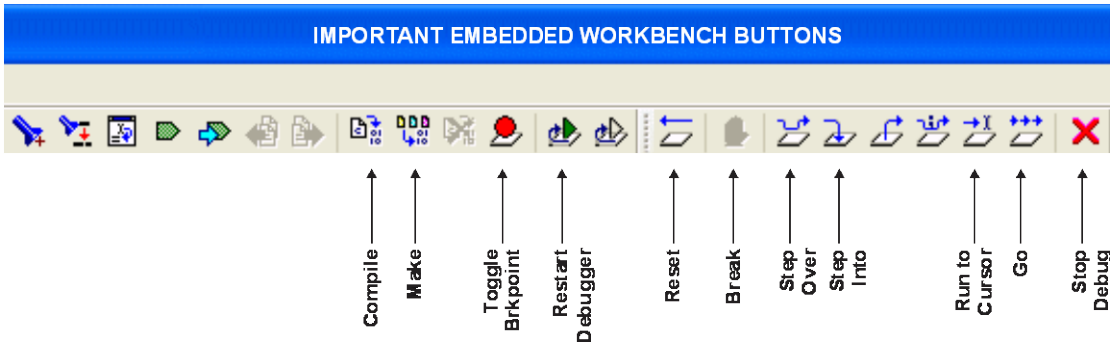
4. If problems occur with IAR installation or with using the IAR debugger, two Holt technical notes are provided to help resolve these issues included on the Holt CD ROM.

5. The demo project only uses unsigned integer variables. Optionally turn off the nuisance compiler message that occurs when a variable's most significant bit toggles. The message looks like this:
   `Remark[Pe068]: integer conversion resulted in a change of sign`
   To disable this diagnostic message, click **Project** then click **Options**
   Category = C/C++ Compiler
   Tab = Diagnostics
   `Suppress these diagnostics:` add "Pe068" to list

6. RAM based projects are not supported due to the limited amount of RAM on the MCU. By design the Cortex™-M3 runs slower in RAM than in Flash so there is little need for a RAM based project.

   Compile the project by clicking the **Make** button. See following illustration. If the Build messages window in IAR Embedded Workbench® indicates no errors or warnings, you can continue. If errors occurred, correct them and recompile the program.

7. Initiate a debug session by clicking the **Restart Debugger** button. This downloads the compiled program into the MCU and readies the board for program execution. Click **Go** to start execution. Click **Break** (normally displayed during execution as a red upheld hand) to stop execution.



8. Click **Break** (normally displayed during execution as a red upheld hand) to stop execution.

Many of the project files are common to all Atmel Cortex M3 example projects located in the …\Atmel\at91sam3u-ek folder. The following is a list and description of the Holt specific HI-8582/8583 demo project files. Some project references may indicate HI-3582A or HI-3583A this is because the demo code is practically the same as the HI-3582A demo code that this project is based on.

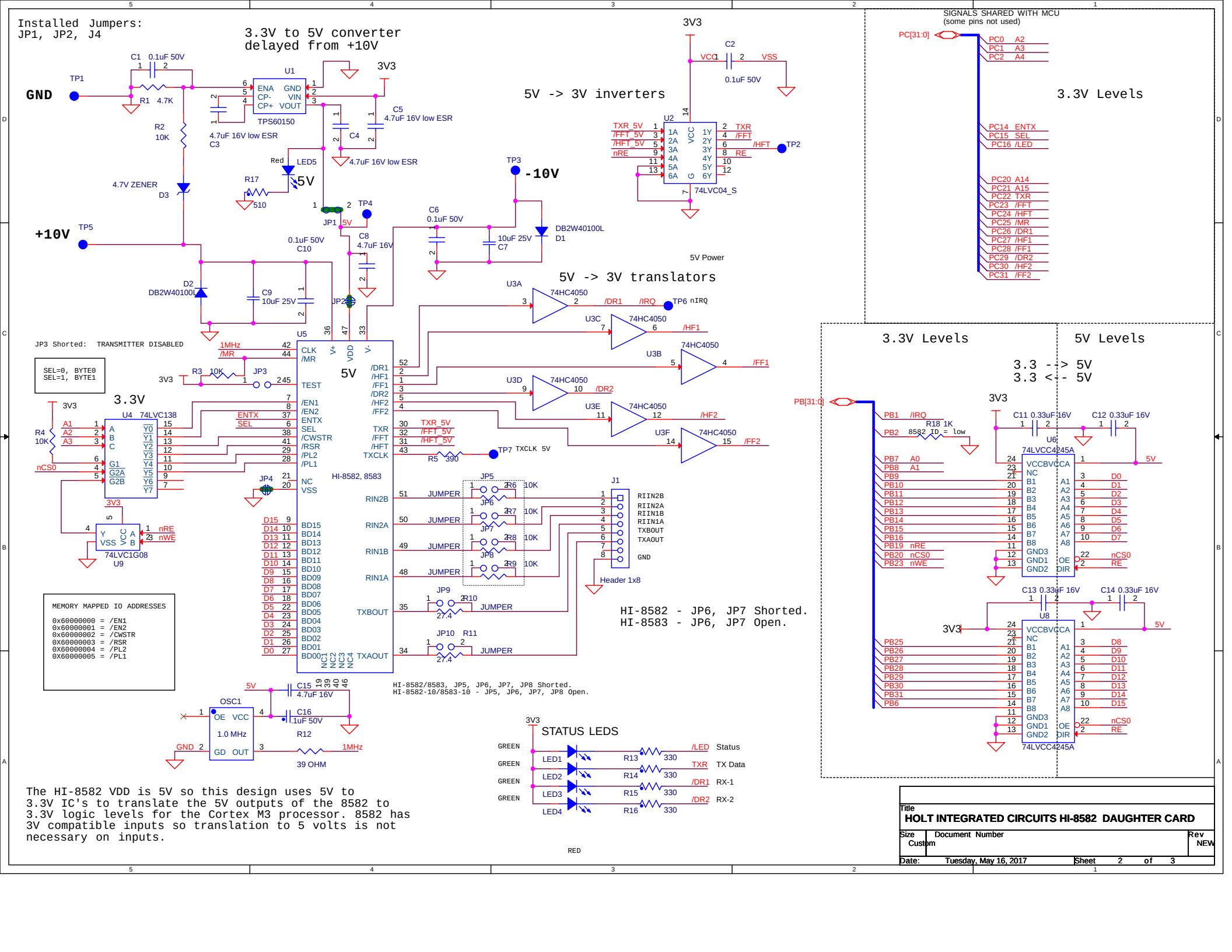
Demo Project files:

Main.c	The main initialization and loop section of the program resides in this file.
Board_EBI.c	Contains code to initialize the (External Bus Interface) EBI interface for the parallel bus going to the HI-8582/8583 16-bit bus.
3582A_83A_Driver.c	**(same files support both HI-3582A and HI-8582 families)** Low-level drivers for the HI-8582/8583. This low-level drive module contains numerous support functions to allow writing to the HI- 3582A/3583A Control Word and reading the Status register, enabling/disabling CR option control bits, initializing and enabling label recognition and other capabilities. This file and the associated header file can be used to start a new customer project using a different processor. Some changes may be required pending on the processor choice.
3582A_83A_Driver.h	Header file.
boardSupport.c	Miscellaneous functions.
boardSupport.h	Header file.
Common.h	Common macros.
Interrupt.c	Interrupt module containing the ISR interrupt function. An ISR function is provided and executes when the Receiver-1 /DR1 signal goes low. Custom user code can be inserted here. A local variable “count” increments with each interrupt to demonstrate the function.
Interrupt.h	Header file.
Console.c	Serial Console input and output functions.
Console.h	Header file.
README.TXT	Provides revision history and other project information.

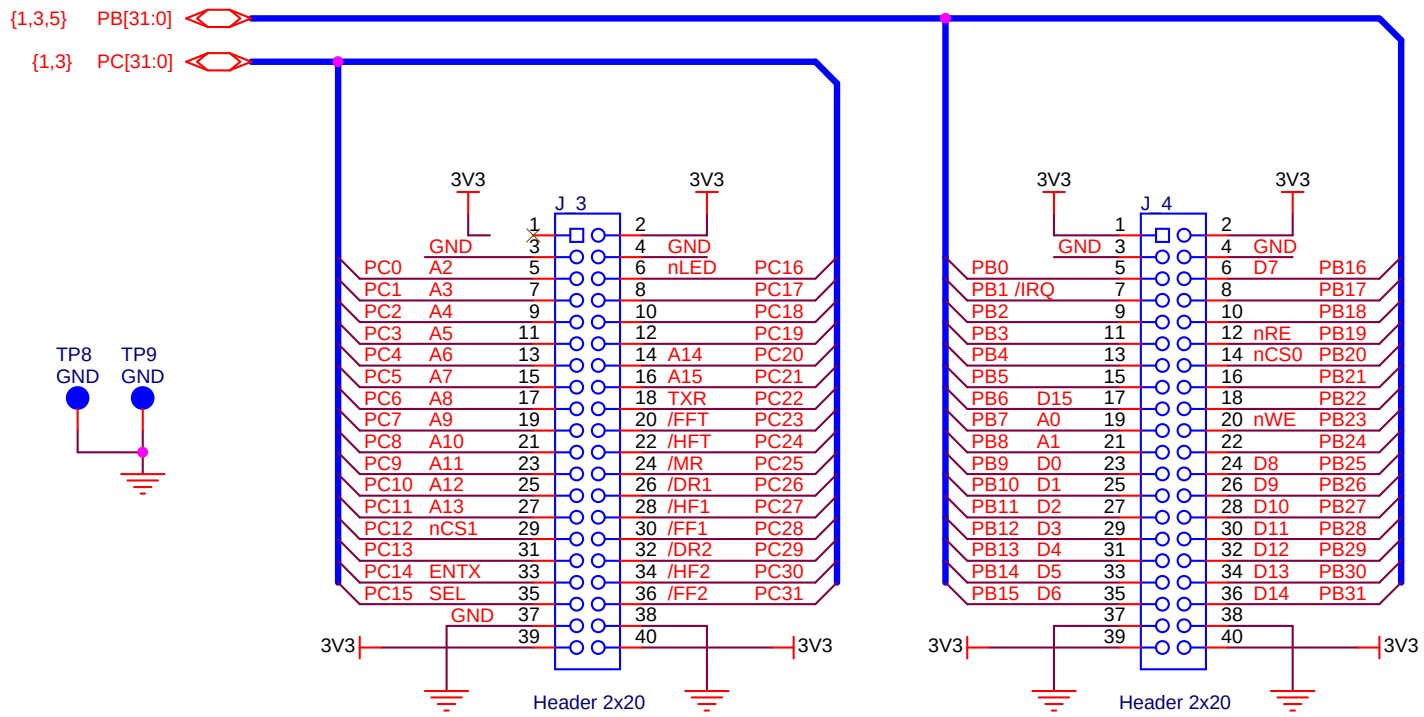
Note: This demo code is nearly identical to the Holt ADK-3582A demo kit. Some references to HI-3582A are to be expected.

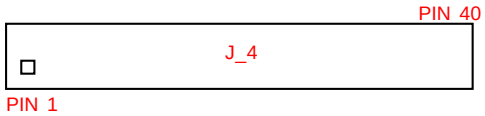
Summary

This Users Guide provides a Quick Start for demonstrating the HI-8582/8583 evaluation board, Users Guide for the software which demonstrates nearly all features of the Holt HI-8582/8583 terminal IC, and provides an introduction to the IAR Embedded Workbench® software development toolset. For new 3.3V designs Holt recommends using HI-3582A, HI-3583A or HI-3584A. For 5V only designs this part is ideal.

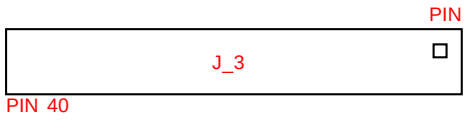

Installed Jumpers:
JP1, JP2, J4
3.3V to 5V converter
delayed from +10V
GND
+10V
-10V
TP1
TP2
TP3
TP4
TP5
TP6 nIRQ
TP7 TXCLK 5V
U1
TPS60150
ENA GND
CP- VIN
CP+ VOUT
C1 0.1uF 50V
C2 0.1uF 50V
C3 4.7uF 16V low ESR
C4 4.7uF 16V low ESR
C5 4.7uF 16V low ESR
C6 0.1uF 50V
C7 10uF 25V
C8 4.7uF 16V
C9 10uF 25V
C10 0.1uF 50V
R1 4.7K
R2 10K
R3 10K
R4 10K
R5 390
R17 510
R18 1K
4.7V ZENER
D3
DB2W40100L
D1
D2
LED5
5V
5V Power
5V -> 3V inverters
U2
74LVC04_S
5V -> 3V translators
U3A 74HC4050
U3B 74HC4050
U3C 74HC4050
U3D 74HC4050
U3E 74HC4050
U3F 74HC4050
JP1
JP2
JP3
JP4
JP5
JP6
JP7
JP8
JP9
JP10
JP3 Shorted: TRANSMITTER DISABLED
SEL=0, BYTE0
SEL=1, BYTE1
3.3V
5V
U4 74LVC138
U9 74LVC1G08
U5
HI-8582, 8583
1MHz
/MR
TEST
/EN1
/EN2
ENTX
SEL
/CWSTR
/RSR
/PL2
/PL1
TXR
/FFT
/HFT
TXCLK
RIN2B
RIN2A
RIN1B
RIN1A
TXBOUT
TXAOUT
/DR1
/HF1
/FF1
/DR2
/HF2
/FF2
TXR_5V
/FFT_5V
/HFT_5V
nRE
nWE
nCS0
JUMPER
J1
RIIN2B
RIIN2A
RIIN1B
RIIN1A
TXBOUT
TXAOUT
GND
Header 1x8
HI-8582 - JP6, JP7 Shorted.
HI-8583 - JP6, JP7 Open.
HI-8582/8583, JP5, JP6, JP7, JP8 Shorted.
HI-8582-10/8583-10 - JP5, JP6, JP7, JP8 Open.
MEMORY MAPPED IO ADDRESSES
0x60000000 = /EN1
0x60000001 = /EN2
0x60000002 = /CWSTR
0x60000003 = /RSR
0x60000004 = /PL2
0x60000005 = /PL1
OSC1
1.0 MHz
39 OHM
STATUS LEDS
LED1
LED2
LED3
LED4
/LED Status
TXR TX Data
/DR1 RX-1
/DR2 RX-2
SIGNALS SHARED WITH MCU
(some pins not used)
PC[31:0]
3.3V Levels
5V Levels
3.3 --> 5V
3.3 <-- 5V
PB[31:0]
U6 74LVCC4245A
U8 74LVCC4245A
The HI-8582 VDD is 5V so this design uses 5V to
3.3V IC's to translate the 5V outputs of the 8582 to
3.3V logic levels for the Cortex M3 processor. 8582 has
3V compatible inputs so translation to 5 volts is not
necessary on inputs.
Title
HOLT INTEGRATED CIRCUITS HI-8582 DAUGHTER CARD
Size Custom
Document Number
Rev NEW
Date: Tuesday, May 16, 2017
Sheet 2 of 3

All signals and power are 3.3V only.





HEADER ORIENTATION
ON THE CIRCUIT BOARD



MCU INTERFACE FOR CORTEX M3 BASED BOARD

Title: HI-8582 EVAL PCB		
Size: A	Document Number	Rev: NEW
Date: Tuesday, May 16, 2017	Sheet 3 of 3	

PCB P/N: HV030
Rev. A

Bill of Materials
HI-8582/83CTX
Evaluation Board

Item	Qty	Description	Reference	DigiKey	Mfr P/N
1	1	PCB, Bare, Eval Board	N/A	--------	Newtek PCB # 13613
2	5	Capacitor, Cer .1uF 20% 50V Z5U 0805	C1,C2,C6,C10,C16	399-1176-1-ND	Kemet C0805C104M5UACTU
3	4	Capacitor, Cer 0.33uF 16V X7R 0805	C11,C12,C13,C14	399-8072-1-ND	Kemet C0805C334K4RACTU
4	5	Capacitor, Cer 4.7uF 16V X7R 1210 Low ESR	C3,C4,C5,C8,C15	587-1392-1-ND	Taiyo Yuden EMK325B7475KN-T
5	2	Capacitor, Cer 10uF 10% 25V X7R 1206	C7,C9	587-3486-1-ND	Taiyo TMK316AB7106KL-T
6	1	Header, Male 1x8 .1" Pitch	J1	S1012E-08-ND	Sullins PEC08SAAN
7	2	Header, Male 2x 20 .1" Pitch	J3,J4	S2012E-20-ND	Sullins PEC20DAAN
8	4	LED Green 0805	LED1 - LED4	160-1179-1-ND	LiteOn LTST-C170GKT
9	1	LED Red 0805	LED5	160-1178-1-ND	LiteOn LTST-C170EKT
10	1	1Mhz Osc, 5V, 4-SOJ, 8.65x14.0mm	OSC1	XC703CT-ND	ECS-8FM-010-TR
11	2	Resistor, 27.4 1% 1/8W 0805	R10,R11	P27.4CCT-ND	Panasonic ERJ-6ENF27R4V
12	1	Resistor, 39 5% 1/8W 0805	R12	P39ACT-ND	Panasonic ERJ-6GEYJ390V
13	4	Resistor, 330 5% 1/8W 0805	R13,R14,R15,R16	P330ACT-ND	Panasonic ERJ-6GEYJ331V
14	1	Resistor, 1K 5% 1/8W 0805	R18	P1.0KACT-ND	Panasonic ERJ-6GEYJ102V
15	1	Resistor, 390 5% 1/8W 0805	R5	P390ACT-ND	Panasonic ERJ-6GEYJ391V
16	1	Resistor, 4.7K 5% 1/8W 0805	R1	P4.7KACT-ND	Panasonic ERJ-6GEYJ472V
17	7	Resistor, 10K 5% 1/8W 0805	R2,R3,R4,R6,R7,R8,R9	P10KACT-ND	Panasonic ERJ-6GEYJ103V
18	2	Diode GP 1A 40V Mini2	D1,D2	DB2W40100LCT-ND	Panasonic DB2W40100L
19	3	Test Point, White Insulator, 0.040" hole	TP2,TP6,TP7	36-5002-ND	Keystone 5002
20	3	Test Point, Black Insulator, 0.062" hole	TP1,TP8,TP9 (GND)	36-5011-ND	Keystone 5011
21	1	Test Point, Red Insulator, 0.062" hole	TP4 (5V)	36-5010-ND	Keystone 5010
22	1	Test Point, Orange Insulator, 0.062" hole	TP5 (+10V)	36-5013-ND	Keystone 5013
23	1	Test Point, Yellow Insulator, 0.062" hole	TP3 (-10V)	36-5014-ND	Keystone 5014
24	1	HI-8582PQ (HI-8283PQ for -1 build)	U5	HOLT IC	Holt IC
25	1	IC Decode/Demux 3-8Line,74LVC138,16-SSOP	U4	296-24670-1-ND	SN74LVC138AMPWTEP
26	1	IC, Hex Inverter, 6 Chan 14-TSSOP	U2	296-1219-1-ND	SN74LVC04APWR
27	1	IC Single Pos AND Gate,74LVC1G08, SOT23-5	U9	296-22345-1-ND	SN74LVC1G08MDBVREP
28	2	IC Bus Transcvr 8 Bit 24-TSSOP	U6,U8	296-8567-1-ND	SN74LVCC4245APWR
29	1	IC Buffer Non-Invert 6V 16-TSSOP	U3	296-9215-1-ND	CD74HC4050PWR
30	1	Charge Pump Switching Reg.,5V,0.14A 6SON	U1	296-27001-1-ND	TPS60150DRVT
31	1	Zener diode 4.7V 150MW 0603	D3	641-1028-1-ND	Comchip Technology CZRU52C4V7