iPLC2 OPTION MDO
100 TURN ABSOLUTE SOFTWARE WITH REMOTE DISPLAY AND REMOTE PRESET OF POSITION

DESCRIPTION OF OPTION:

This option provides three different functions. The first function allows the unit to function as a multi-turn absolute limit switch. This means that the unit will always read the correct position on power up even if the transducer shaft had been rotated after power was removed from the controller. Programmable number of turns are 1, 2, 4, 5, 10, 20, 25, 50, and 100. Two different transducers can be used with this option. The HTT-20-100 is a 100 turn transducer and is the one most commonly used with this option. It offers the user up to 100 turns of the shaft full scale with a maximum resolution of 1024 counts per turn. The 1000 turn transducer, (HTT-20-1000), is identical to the HTT-20-100 but with a 10:1 gear reduction on the shaft. This offers the user up to 1000 turns full scale with a maximum resolution of 102.4 Counts per turn. Print B1016 is the outline drawing for both transducers.

The second option sends position and tachometer data to an AMCI D6000 Remote Display over a 9600 BAUD RS422A serial link. This allows the user to monitor both the position of the system and the speed that it is running at from a remote location with only a three wire link.

The third function is an input to the iPLC2 (IN1) that allows the user to preset the controllers position to any value within its Full Scale Count.

PROGRAMMING CHANGES AND ADDITIONS:

Because the unit is a single axis limit switch, its operation is very similar to the iPLC1. Most changes in programming are made to allow the user to program the larger numbers available with the multi-turn software. The function of the following keys have been changed.

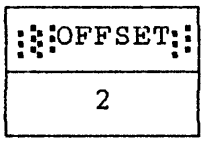
POS/TAC
0

This Key is still used to display Position and Tachometer information, however this key shows this information sequentially. Pressing this key while displaying POS will force the unit to display TACH data and visa versa.

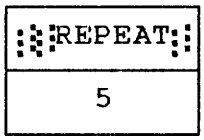
SF
1

This key is still used to display and program the unit's Scale Factor. This key allows the user to program the Full Scale Turns and the Full Scale Factor. (See Example below.)

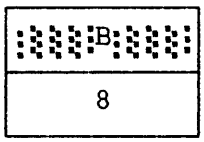
PROGRAMMING CHANGES AND ADDITIONS: (cont'd)



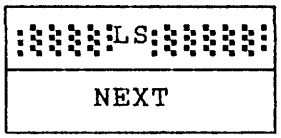
This key is still used to program the Offset but the display now shows only the offset number instead of both the Offset and the Position numbers together.



Repeat Setpoint Programming is not available with this unit. This key is instead used to program a Decimal Point for use with the Position, Offset, and Limit Setpoint displays. See the Programming Example below.



This key is used to program the Preset Number for the Remote Preset function. The position will be changed to the preset number when the remote input is active. The Preset Number can be any number between zero and the Full Scale Count. See the Programming Example below.



This key is still used to program the Limit Setpoints but the display has changed. Because the Position value for each setpoint can be up to six digits long, the FROM and TO setpoint are programmed sequentially instead of on the same display. Fine tuning of the limit setpoints with the Increment/Decrement keys is not available with this option. See the Programming Example below.

PROGRAMMING EXAMPLES:

SCALE FACTOR:

NOTE: Only those turns that produce a whole number when divided into 100 are allowed. These numbers are 1, 2, 4, 5, 10, 20, 25, 50, and 100.

It is possible that the users Full Scale Number of Turns does not equal one of the numbers that can be programmed into the Controller. However, if the number of Counts per Turn does not exceed 1024, this problem can be easily overcome as the following example illustrates.

The user has a Full Scale travel of 21 Turns and needs a Total Count of 20,500.

The first thing that the user must check is the number of Counts per Turn. He divides 20,500 by 21 and sees that the counts per turn equals 976.19. He now knows that he can program the controller to work with the system.

The second step is to multiply the number of counts per turn (976.19) by the number of turns that he can program into the controller. The number of turns that the user programs into the controller must be greater than the number of turns that he will be using. The user chooses 25 as the number of turns that he will program into the Controller. Multiplying 976.19 by 25 gives an answer of 24,404.76 which he rounds off to 24,405. The user now has the two values that he needs to program the Scale Factor of the Controller.

Number of Turns = 25
Full Scale Counts = 24,405

PRESS	DISPLAY	COMMENTS
*		Must be in Program Mode. See Section 12.1 of the Users Manual.
[FUNCTION]		Function LED "on".
[SF]	"N.TURNS xxx"	Present Number of Turns
[0,2,5, ENTER]	"N.TURNS 025"	Full Scale Turns = 25

(continued on next page)

PROGRAMMING EXAMPLES: (cont'd)

SCALE FACTOR: (cont'd)

PRESS	DISPLAY	COMMENTS
[SF]	"F.SC 25600"	Full Scale Count display. The displayed number is the maximum count allowed for the number of turns entered. The number equals 1024 * Full Scale Turns.
[2,4,4,0,5], [ENTER]	"F.SC 24405"	Full Scale Count = 24405
[SF]	"SF 976.200"	Calculated number of Counts per Turn. (Scale Factor)

DECIMAL POINT:

The user in the previous example wishes to program a Decimal Point so that his display reads with the last three digits are after the decimal point. (Example 4,321) The keystrokes are shown below.

PRESS	DISPLAY	COMMENTS
*		Must be in Program Mode. See Section 12.1 of the Users Manual.
[FUNCTION]		Function LED "on".
[REPEAT]	"DEC.POINT x"	Present Decimal Point.
[3], [ENTER]	"DEC.POINT 3"	Decimal Point now set to be three digits from the right.

PROGRAMMING EXAMPLES: (cont'd)

REMOTE PRESET:

The user in the previous examples also wishes to use the remote preset function to set the controller to display a position of 2,500 when the system is set up and ready to run. He can then use a remote switch to preset the Controller before running the machine. The keystrokes are shown below.

PRESS	DISPLAY	COMMENTS
*		Must be in Program Mode. See Section 12.1 of the Users Manual.
[FUNCTION]		Function LED "on".
[B]	"PR, xx,xxx"	Present Preset Number.
[0,2,5,0,0], [ENTER]	"PR, 02,500"	Programmed Preset Number. The unit will go to this number whenever the remote input (IN1) is pulled high.

LIMIT SETPOINTS:

The user in the above examples also wishes to program the following Limit Setpoints.

CH 1: From 10,000 To 10,010
CH 2: From 20,000 To 20,020 and
From 20,030 To 20,040

PRESS	DISPLAY	COMMENTS
*		Must be in Program Mode. See Section 12.1 of the Users Manual.
[FUNCTION]		Function LED "on".
[LS]	"LS,xx "	Limit channel display

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PROGRAMMING EXAMPLES: (cont'd)

LIMIT PROGRAMMING: (cont'd)

PRESS	DISPLAY	COMMENTS
[0,1], [ENTER]	"01F, __,___"	CH 1 FROM Setpoint display
[1,0,0,0,0], [ENTER]	"01F, 10,000"	Limit From 10,000
[NEXT]	"01T, __,___"	CH1 TO Setpoint display
[1,0,0,1,0], [ENTER]	"01T, 10,010"	Limit To 10,010
[NEXT]	"01F, __,___"	CH1 FROM Setpoint display
[NEXT]	"02F, __,___"	CH2 FROM Setpoint display
[2,0,0,0,0], [ENTER]	"02F, 20,000"	Limit From 20,000
[NEXT]	"02T, __,___"	CH2 TO Setpoint display
[2,0,0,2,0], [ENTER]	"02T, 20,020"	Limit To 20,020
[NEXT]	"02F, __,___"	CH2 FROM Setpoint display
[2,0,0,3,0], [ENTER]	"02F, 20,030"	Limit From 20,030
[NEXT]	"02T, __,___"	CH2 TO Setpoint display
[2,0,0,4,0], [ENTER]	"02T, 20,040"	Limit To 20,040

NOTE: When Programming from existing setpoints, erase the old setpoints or write over them. Both FROM and TO setpoints must be displayed and the ENTER Key must be pressed for both of them even if only one setpoint is being changed.

REMOTE DISPLAY INTERFACE:

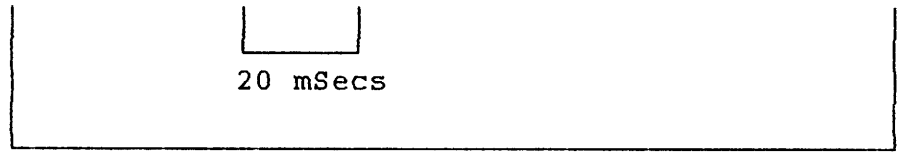
The Remote Display Interface is used to supply the Transducer Position and Tachometer data to a remote location. The position data is sent out over the serial link every 20 mSecs. The Tachometer data is sent out over the serial link every 500 mSecs. The format of the serial data is as follows:

Elec. Specs : RS422A
BAUD Rate : 9600 bits/sec
Serial Frame : 10 bit
1 Start Bit
7 Data bits
1 Parity bit
1 Stop bit

The Parity bit is not used and equals 0.
All of the data are ASCII encoded characters.

The data format is shown below. All data is in the form of ASCII characters.

@T3YYY@XXXXX@XXXXX@XXXXX@XXXXX@ ..... @XXXXX@T3YYY@XXXXX@
...



500 mSecs

XXXXX = Position Data in Hexidecimal Notation
YYY = Tach Data in Hexidecimal Notation

"@", "T", and "3" are ASCII Characters.

D6000 REMOTE DISPLAY:

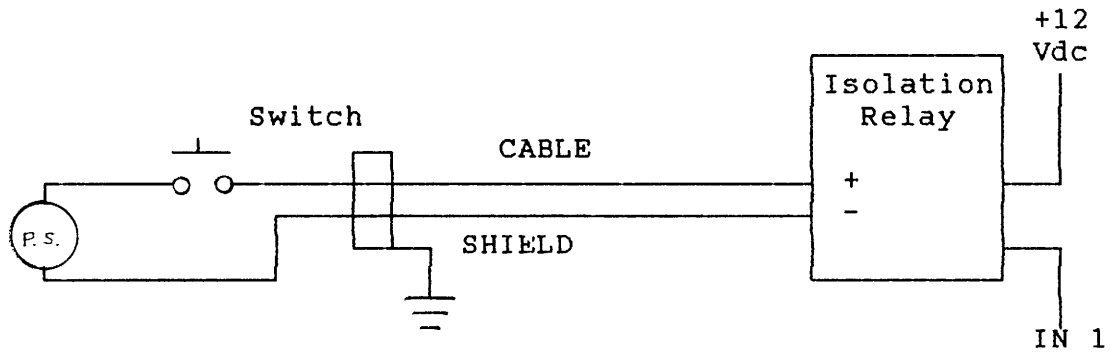
The Serial Data is formatted to work with AMCI's D6000 Remote Display. The D6000 has six 5/8" LED digits that is easily visible. The [POS/TACH] Key is used to switch the display between Position and Tach data. The data can be distinguished by a LED to the left of the display. When the LED is on, the unit is displaying Tach data. The [A] Key is for optional features and is not used by this option.

The print that shows the pinout for the serial cable is Print Number A1033 Rev. A. Also of interest is the Outline Drawing of the D6000 which is Print Number B1022.

REMOTE POSITION PRESET:

The transducer position will be preset to it's programmed value when the INPUT 1 is active. The input will be considered active when the Controller senses that the input has gone through a low to high logic level transition. The Controller samples the input every 400 uSecs. The Controller then generates the required Offset to bring the transducers position to its preset value and stores the Offset in RAM Memory. Note that the offset is not the same as the Offset programmed from the keyboard and is not stored on power down.

Normally Open, Momentary Contact Switches should be used to complete the circuit on these inputs. Note that an isolation relay is used between the remote switch and the Controller. This is required to protect the Controller from Ground loops or high common mode voltages.



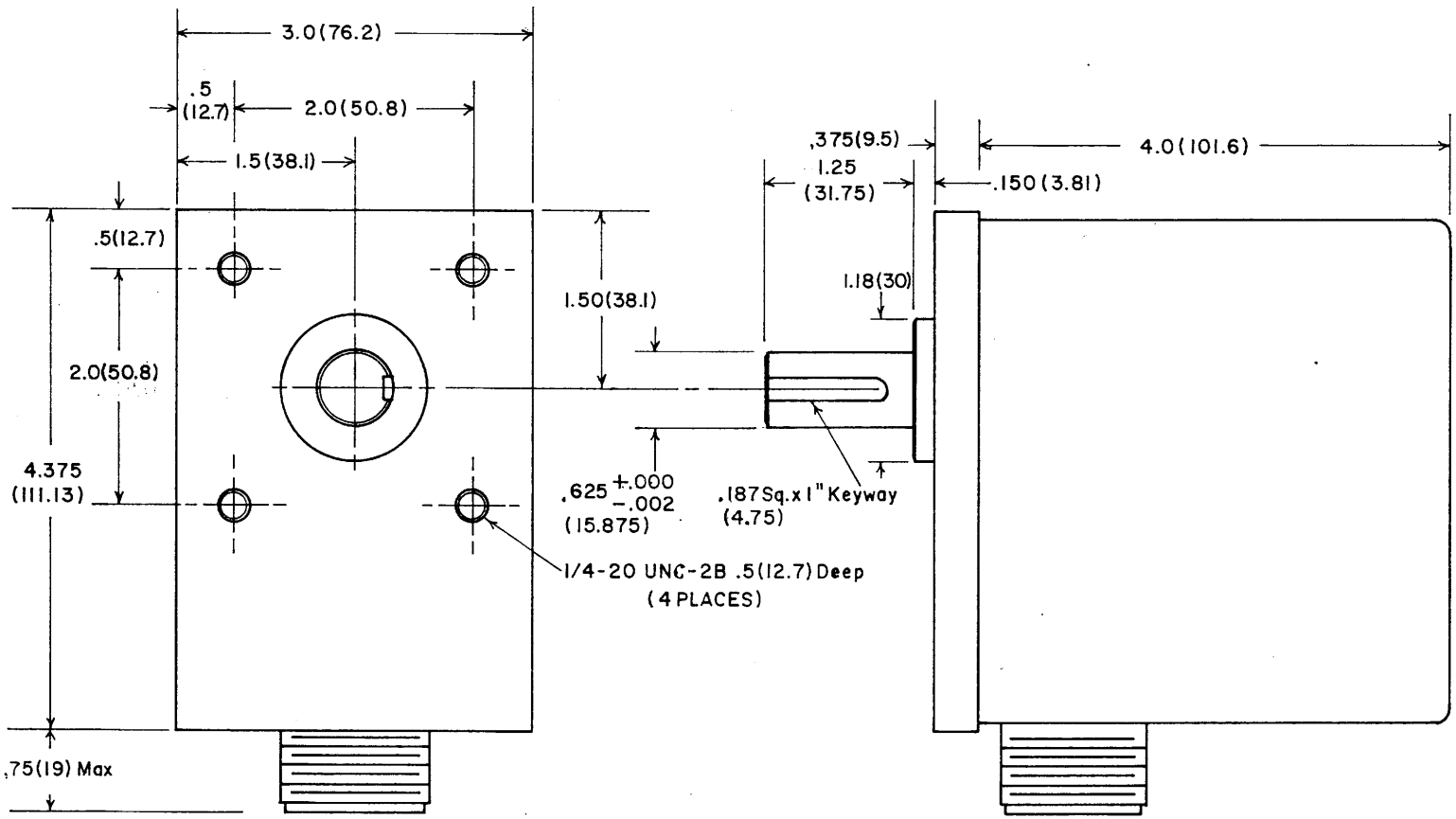
MODEL NUMBER AND CHECKSUM:

The following keystrokes will display the Model Number and Checksum of an IPLC2 unit with an Options MDO.

PRESS	DISPLAY	COMMENTS
[PROGRAM]	"PROGRAM x"	x = Number of running program.
[NEXT]	"IPLC2-MD-2"	Model and Revision Number
[NEXT]	"EPROM CBF8"	Software Checksum

AMCI is constantly improving the Software it installs in its units. The Model Number and Checksum may not be the same as shown above.

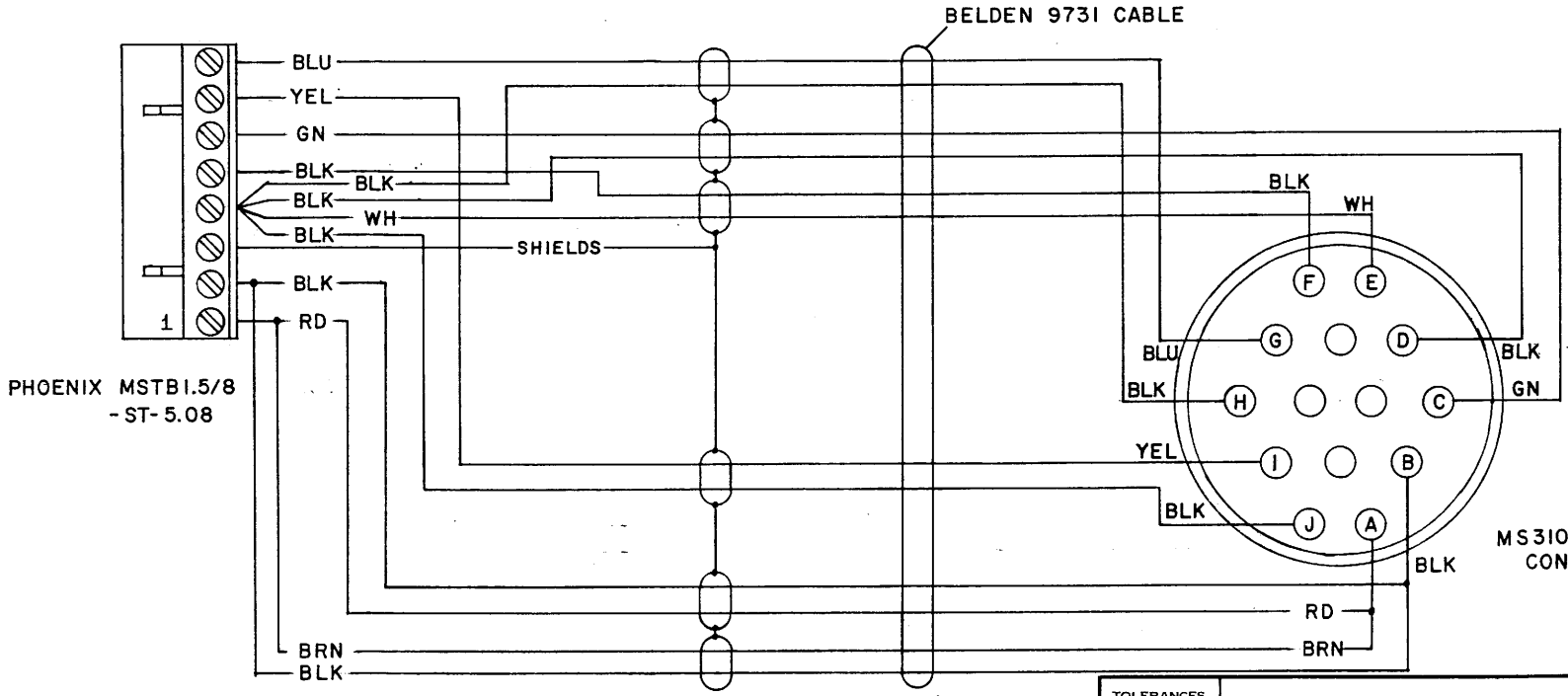
DATE	SYM	REVISION RECORD	AUTH.	DR.	CK.



MS3102E20-27P Connector

TOLERANCES (EXCEPT AS NOTED)	AMCI		
DECIMAL ±	HTT-20-(X) (X)- Full Scale Turns	SCALE	DRAWN BY JR APPROVED BY WXE
FRACTIONAL ±	TITLE OUTLINE DRAWING		
ANGULAR ±	DATE 6/1/87	DRAWING NUMBER B1016	

DATE	SYM	REVISION RECORD	AUTH.	DR.	CK.



FOR CABLE RUNS: LESS THAN 300FT. (91.44m) - 5.0KHZ Ref.
" " 600FT. (182.88m) - 2.5KHZ Ref.

CONNECTIONS ARE FOR CW INCREASING READINGS [LOOKING AT TRANSDUCER SHAFT]. FOR CCW INCREASING READINGS, REVERSE G/H PAIR AND REVERSE C/D PAIR.

TOLERANCES (EXCEPT AS NOTED)	**AMCI**		
DECIMAL ±	CTT-(X) (X)-Length in feet	SCALE	DRAWN BY JR APPROVED BY LDXE
FRACTIONAL ±	TITLE: TRANSDUCER CABLE DRAWING		
ANGULAR ±	DATE: 5/23/86	DRAWING NUMBER: B1040	